SONY

DIGITAL VIDEOCASSETTE RECORDER

HDW-250

HDCAM

Tele-File

ISR Interactive Status Reporting

OPERATION MANUAL English

1st Edition(Revised 1)

Serial No. 10001 and Higher

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

For the customers in U.S.A.
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

For the customers in the U.S.A. and Canada

RECYCLING NICKEL-CADMIUM BATTERIES

Nickel-Cadmium batteries are recyclable. You can help preserve our environment by returning your unwanted batteries to your nearest point for collection, recycling or proper disposal.
Note: In some areas the disposal of nickel-cadmium batteries in household or business trash may be prohibited.

RBRC (Rechargeable Battery Recycling Corporation) advises you about spent battery collection by the following phone number.

Call toll free number: 1-800-822-8837 (United States and Canada only)

Caution: Do not handle damaged or leaking nickel-cadmium batteries.

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1-1 Features

The HDW-250 is a high-definition, HDCAM[1)]-format portable digital videocassette recorder that uses large-scale LSI circuitry to achieve the same lightness, smallness, and ease of use of conventional digital Betacam recorders.

1-1-1 Features of the HDW-250

The following are some of the features of the HDW-250.

Design suitable for field operations

The compact and lightweight design of the VTR (with a main-unit weight of approximately 7.8 kg (17 lb 3 oz)) makes it ideal for use in the field. Its 40-watt power consumption (during recording with the MODE switch set to SAVE, the CONFI switch set to OFF, and the output from both the HD SDI OUT connector and the COMPOSITE MONITOR OUT connector turned off) supports about 1.5 hours of continuous shooting when powered by an optional battery pack.

High-speed, color-playback searching

The VTR supports searching with color playback at speeds of 2×, 5×, or 8× normal speed.

Ease of operation with two LCD panels

Two LCD panels on the front panel provide the convenience of simultaneously viewing unit status and time data (on the smaller LCD) and audio level meters, video level meters, setup menu, and error messages (on the larger LCD).
Different audio level meter display modes allow adjustments to be made more finely, while a backlight facilitates viewing under dark conditions.

Input interface

An HD analog component signal from the camera or HD SDI signal can be selected as the input signal.
In the HD SDI format, which is based on the SMPTE 291M, 292M, 299M (BTA S-004B, -005B, -006B)/ ARIB STD B-4 high-definition component serial digital interface format, a single BNC coaxial cable carries one component video signal, four channels of digital audio signal, and time code in time-division multiplex. These signals are then separated for conversion to parallel data.
Audio signals undergo A/D conversion that allows them to be recorded digitally.

Output interface

Component video signals are converted into serial data, multiplexed with audio signal and time code, and then output in a high-definition serial digital interface format. A high-definition analog component signal is output for monitoring. Output of an analog composite signal is also supported using the internal down-converter.
Audio signals undergo digital-to-analog conversion, and are then output.

Advanced recording and playback functions

High-quality digital recording

The HDCAM format uses a component system for video recording, while the 4-channel audio recording system uses the AES/EBU format with a wide dynamic range. The digital video processor incorporates powerful error correction and concealment circuitry.
Accurate and stable video signal output is made possible through the setting and adjustment of an internal digital video processor.

Video and audio confidence heads

The video and audio signals (channels 1 to 4) can be recorded and simultaneously played back for realtime monitoring.

Internal time code generator and reader

The VTR's internal time code generator allows you to record time code (LTC or user's bits) along with the video and audio signals, and an internal time code reader reads the recorded time code during playback.

Computer-controlled servo system

Computer-controlled servo motors provide direct drive for the drum, capstan, and two reels for quick and accurate tape operation.

Independent audio level controls

You can adjust the recording and playback levels of each of the four audio channels while monitoring their peak levels.

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1) HDCAM is a trademark of Sony Corporation.

Other features

Tele-File[1)] memory label system

The HDW-250 conforms to the Tele-File memory label system which enables you to record time code data for cue points onto optional MLB-1B-100 memory labels (not supplied) while recording to a cassette. This data can be later recalled and updated, thereby allowing cassette tapes and their contents to be more efficiently managed and edited.

Remote control operation

The VTR has a serial RS-422A 9-pin connector that allows you to control the VTR from an external control unit.

Self-diagnosis

The VTR performs self-diagnostics whenever a malfunction occurs. It also displays error and warning messages and keeps a log of all errors that have occurred.

1-1-2 HDCAM Format

Based on the Digital Betacam format, the HDCAM format retains the same ease of use of its predecessor, while yielding high-performance, high-definition digital recording and playback. The HDCAM format uses the following technologies:

- Bandwidth restrictions and a new coefficient recording system providing data compression by a factor of seven
- Powerful error-correcting codes
- High-performance, high-accuracy heads providing highly reliable, narrow-track recording and playback

Together, these technologies support a recording time of 120 minutes or more on an L-size, 1/2-inch HDCAM cassette the same size as a conventional Digital Betacam cassette.

Digital signal processing

On an HDCAM VTR, a 4:2:2 component video signal, which has been quantized according to ITU-R709/ SMPTE 274M/SMPTE 260M (BTA S-002B) standards, is subjected to a 3:1:1 bandwidth restriction, and is further compressed with a coefficient recording system. Audio signals are subjected to full-bit processing in the AES/EBU format.

Bit rate reduction encoder

Component video signal data is compressed by a factor of about four by a process in which it is subjected to frame shuffling, blocking, DCT (discrete cosine transform), quantizing adjustment, and variable length word encoding. These processes form the core of the coefficient recording system.

ECC encoder

The outer ECC (Error Correction Code) is added to the compressed video and audio data, followed by the inner ECC, ID data, and sync data. The Reed-Solomon code is used in this error correction system.

Channel coding

Video and audio data with the ECC added are recorded in the form of serial data. The HDCAM format adopts a scrambled NRZI channel coding system for off-track and noise tolerance characteristics.

Playback signal processing

The playback digital data is equalized by equalizer circuits and error-corrected by powerful inner and outer ECCs. This processing corrects most noise and dropout-related problems in the reproduced signal. Data that cannot be completely corrected in this way is passed through a bit reduction decoder and corrected by an error concealment circuit.

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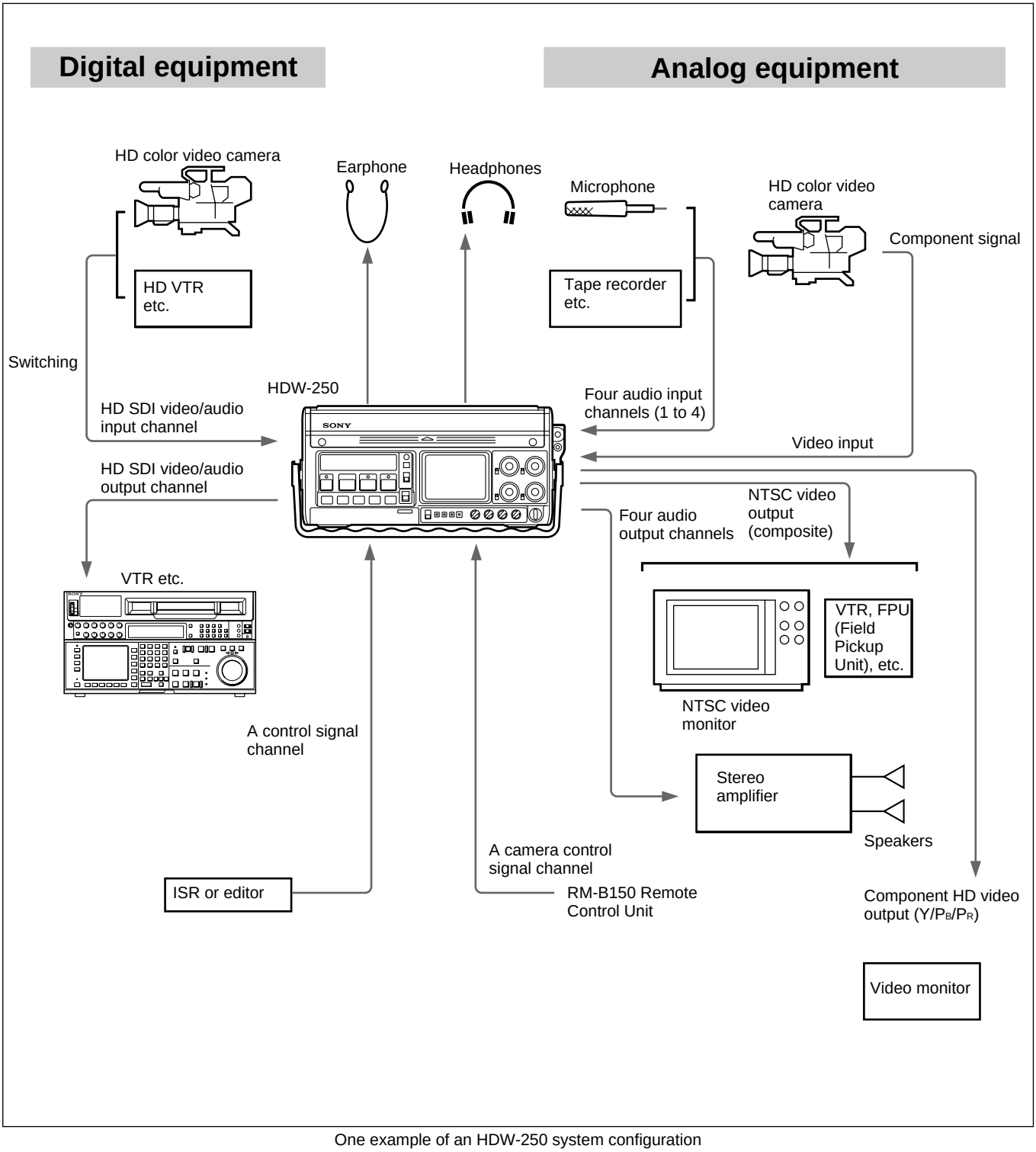
1) Tele-File
A system for saving and recalling recording-related information using a cassette label that incorporates a non-contact memory IC.
Tele-File is a registered trademark of Sony Corporation.

1-2 System Configuration

The following figure shows one example of a system configuration centered on the HDW-250.

For details on connector names, see “4-1-1 Connecting Digital Equipment” (page 4-1) and “4-1-2 Connecting Analog Equipment” (page 4-2).



One example of an HDW-250 system configuration

1-3 Getting the Best Performance From the VTR

Precautions concerning operation and storage

Protect the VTR from violent shocks

Violent impacts to the VTR may damage the internal circuitry and mechanism or the external finish.

After use

Turn the power off.

When not using the VTR for an extended period of time

Remove the cassette and battery pack.

Operating and storage locations

Store the VTR at a level place that is well ventilated. Avoid operating or storing the VTR at a place subject to the following conditions:

- Extreme heat or coldness
- Dust
- Humidity
- Severe vibration
- Strong magnetic fields
- Prolonged exposure to direct sunlight, or in the proximity of heating equipment

Condensation

If you move the VTR suddenly from a cold place to a warm place, or use it in a very humid location, condensation may form on the head drum. If the VTR is operated under these conditions, the tape may adhere to the drum and cause an operational problem or even permanent damage. Take the following steps to prevent this from happening:

- Remove the cassette before moving the VTR to the location where condensation is likely to occur.
- If the warning message “10 HUMID” appears in the display, condensation has been detected. Wait until the message disappears. Then insert a cassette.
- Do not load a cassette into a VTR in which condensation has formed.

Cleaning the video heads

Use the Sony BCT-HD12CL Cleaning Cassette to clean the audio and video heads. Follow the instructions that came with the cleaning cassette.

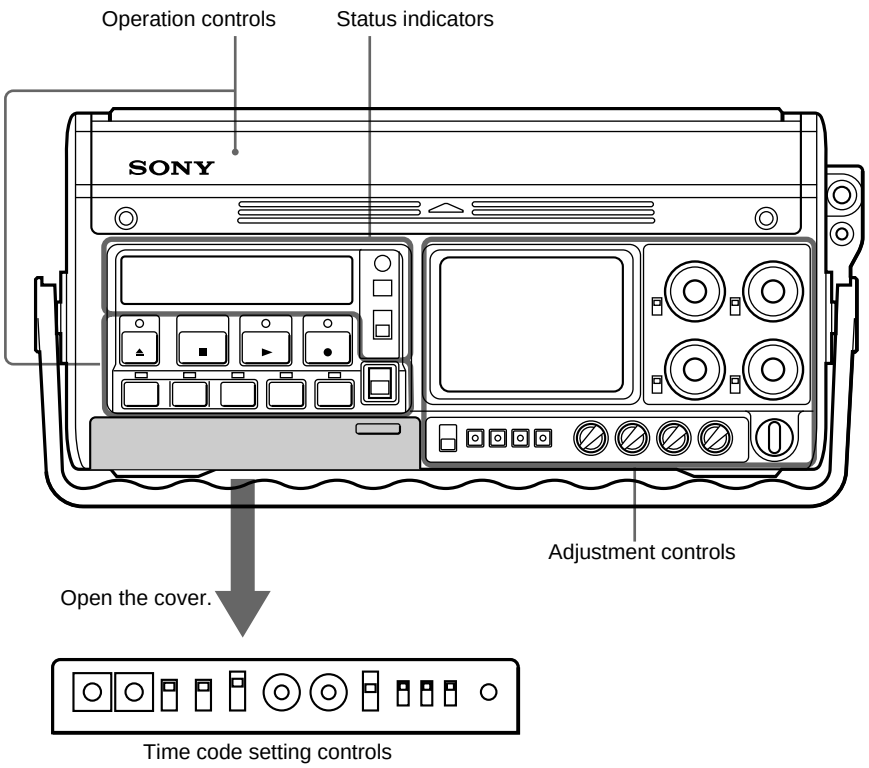
Related manuals

In addition to this operation manual, the following manuals have been prepared for use with the VTR. Consult them as necessary.

- Maintenance manual part 1 (supplied)
  Describes VTR maintenance procedures.
- Maintenance manual part 2 (not supplied)
  Contains circuit diagrams and adjustment procedures required for the maintenance of the VTR.

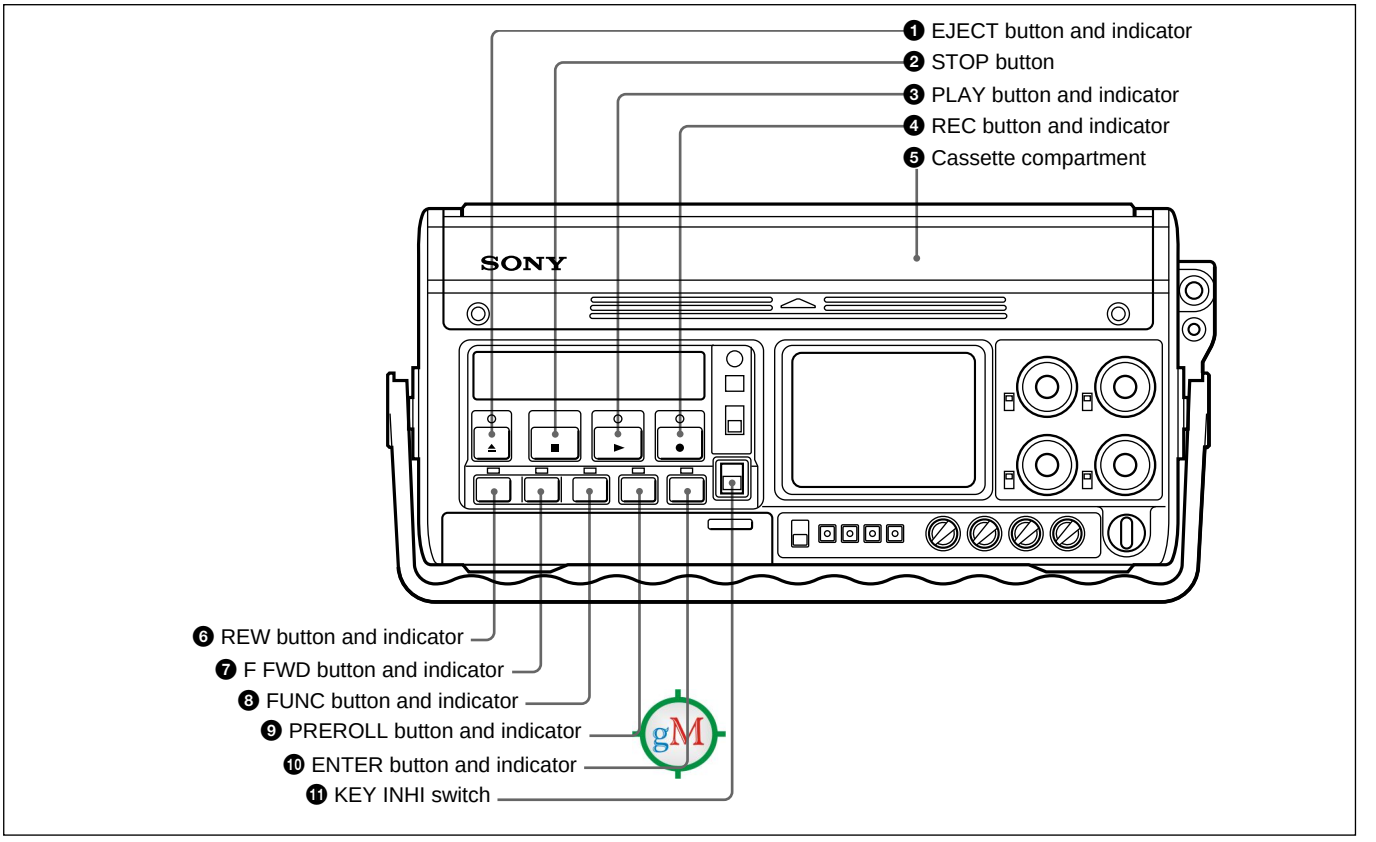
2-1 Front Panel

The front panel is divided into the four sections below:
• Operation controls
• Status indications
• Adjustment controls
• Time code setting controls
The time code setting controls are normally covered by a hinged cover.



Front panel

2-1-1 Operation Controls


❶ EJECT button and indicator
❷ STOP button
❸ PLAY button and indicator
❹ REC button and indicator
❺ Cassette compartment
SONY
❻ REW button and indicator
❼ F FWD button and indicator
❽ FUNC button and indicator
❾ PREROLL button and indicator
❿ ENTER button and indicator
⓫ KEY INHI switch

Operation controls

❶ EJECT ⏏ button and indicator
Press to eject the cassette. The indicator lights up as the cassette is being ejected.

❷ STOP ■ button
Press to stop the tape transport.
Press this button while the VTR is not in standby mode to enter standby mode. Press this button again in standby mode to restart the head drum timer countdown (i.e., the period after which the head drum rotation is automatically stopped to protect the tape) as set by the STILL TMR setting in the VTR CONTROL menu (see page 7-5)).
To exit standby mode, press this button while holding down the FUNC button (see page 2-3).

❸ PLAY ► button and indicator
Press this button to play back a tape. To start recording press this button and the REC ● button simultaneously. The indicator lights up during playback or recording. It flashes during recording to indicate that the VTR is not locked to the recording signal.

❹ REC ● (record) button and indicator
Press this button and the PLAY ► button simultaneously to start recording. When the assemble or automatic assemble recording mode is selected, the indicator flashes when the VTR pre-rolls.

❺ Cassette compartment
Raise the cover in the direction indicated by Δ and insert the cassette.

❻ REW ◄◄ (rewind) button and indicator
The function of this button varies according to the VTR status and the button with which it is simultaneously pressed.

Rewinding the tape
Press this button to rewind the tape. The indicator flashes while the VTR is rewinding the tape and turns off when rewinding is completed.

Doing a tape search in the reverse direction at a specified speed
Hold down this button while the VTR is rewinding the tape. The tape is searched as it is being rewound at the speed specified by SEARCH in the VTR CONTROL menu (2×, 5×, or 8× normal playing speed) (see page 7-5). The indicator flashes during the search operation.

Changing the search speed during a reverse-search of the tape
Press this button while holding down the FUNC button. Each time you press the REW ◀◀ button, the search speed changes from the current speed to the next one in sequence (2×, 5×, or 8× normal playing speed), regardless of the SEARCH setting in the VTR CONTROL menu.

Changing to still-picture mode
Press this button and F FWD ▶▶ button simultaneously. When you release either of the buttons, the VTR searches the tape at normal playing speed in the direction indicated by the button that is still being pressed. When you release both buttons, the VTR stops.

❼ F FWD ▶▶ (fast-forward) button and indicator
The function of this button varies according to the VTR status and the button with which it is simultaneously pressed.

Fast-forwarding the tape
Press this button to fast-forward the tape. The indicator flashes as the tape is fast-forwarding, and turns off when fast-forwarding is completed.

Doing a tape search in the forward direction at a specified speed
Hold down this button while the VTR is fast-forwarding the tape. The tape is searched as it is being fast-forwarded at the speed specified by SEARCH in the VTR CONTROL menu (2×, 5×, or 8× normal playing speed) (see page 7-5). The indicator flashes during the search operation.

Changing the search speed during a forward-search of the tape
Press this button while holding down the FUNC button. Each press of the F FWD ▶▶ button changes the search speed (2×, 5×, or 8× normal playing speed), regardless of the SEARCH setting in the VTR CONTROL menu.

Changing to still-picture mode
Press this button and REW ◀◀ button simultaneously. When you release either of the buttons, the VTR searches the tape at normal playing speed in the direction indicated by the button that is still being pressed. When you release both buttons, the VTR stops.

❽ FUNC (function) button and indicator
Press this button while the tape is stopped, or during fast-forwarding or rewinding to monitor the E-E signal[1)] output from the ANALOG HD COMPONENT MONITOR OUT connector and the COMPOSITE MONITOR OUT connector (see page 2-15). If you press the button with no cassette loaded, the VTR enters E-E mode[2)]. Note that E-E signal monitoring is possible only when V TEST SG in the SYSTEM menu is set to OFF (see page 7-13).

1) E-E (Electric-to-Electric) signal
A signal that passes solely through internal circuitry, and not through pathways in which magnetic conversion take place, such as magnetic heads and tapes.

2) E-E (Electric-to-Electric) mode
A state in which E-E signal can be monitored. Commonly used to monitor input signals before they are recorded.

The function of this button varies according to the VTR status and the button with which it is simultaneously pressed, as follows:

When pressed together with	The VTR does the following:
STOP ■ button (page 2-2)	Exits from standby mode.
REW ◀◀ button (page 2-2)	Does a search in the reverse direction. Each press of the REW ◀◀ button changes the search speed (to 2×, 5×, or 8×).
F FWD ▶▶ button (page 2-3)	Does a search in the forward direction. Each press of the F FWD ▶▶ button changes the search speed (to 2×, 5×, or 8×).
ENTER button (this page)	Sets an IN point. The time code at the time the ENTER button is pressed is recorded as the IN point. If the automatic assemble recording mode is selected, the next recording operation automatically starts from this point. *For details on selecting the recording mode, see the section about the REC MODE in the EDIT menu (page 7-6).* **To start recording from the IN point in assemble recording mode** Use the PREROLL button (see this page) to cue to the IN point.
PREROLL button (this page)	Cues to the starting point of the last recording.

❾ PREROLL button and indicator

Press to cue to EOS[1]. When an IN point has been set, press to cue to the IN point. When ASM (assemble) or AUTO (automatic assemble) recording mode is selected, the VTR cues up to a point about 3 seconds before the EOS or IN point. The indicator flashes while the VTR is cueing.

Press this button while holding down the FUNC button (see page 2-3) to cue to the starting point of the last recording.

Notes

- When the time code is used for pre-rolling, the time code on the tape must be properly sequential.
- The VTR does not support pre-rolling using the VITC.

❿ ENTER button and indicator

The function of this button varies according to the VTR status and the button with which it is simultaneously pressed.

Setting a cue point

Press this button during recording, playback, or in standby mode to set the current time code as a cue point.

When a videocassette with a MLB-1B-100 memory label for the Tele-File system (not supplied) is inserted, cue point data can be recorded to the memory label and later recalled using the TELE FILE menu.

Setting an IN point

Press this button while holding down the FUNC button (see page 2-3). The indicator lights up when an IN point is entered. The time data for the IN point appears in the INFORMATION (see page 4-3). To delete an IN point, press this button while holding down the SHIFT/DEL button (see page 2-10) in any menu other than TELE FILE menu.

⓫ KEY INHI (inhibit) switch

Use this switch to prevent misoperations due to accidental key operations.

ON: All operation buttons are disabled.

OFF: Only the STOP ■ and ENTER buttons are operable if the VTR is recording. All buttons are operable under all other conditions.

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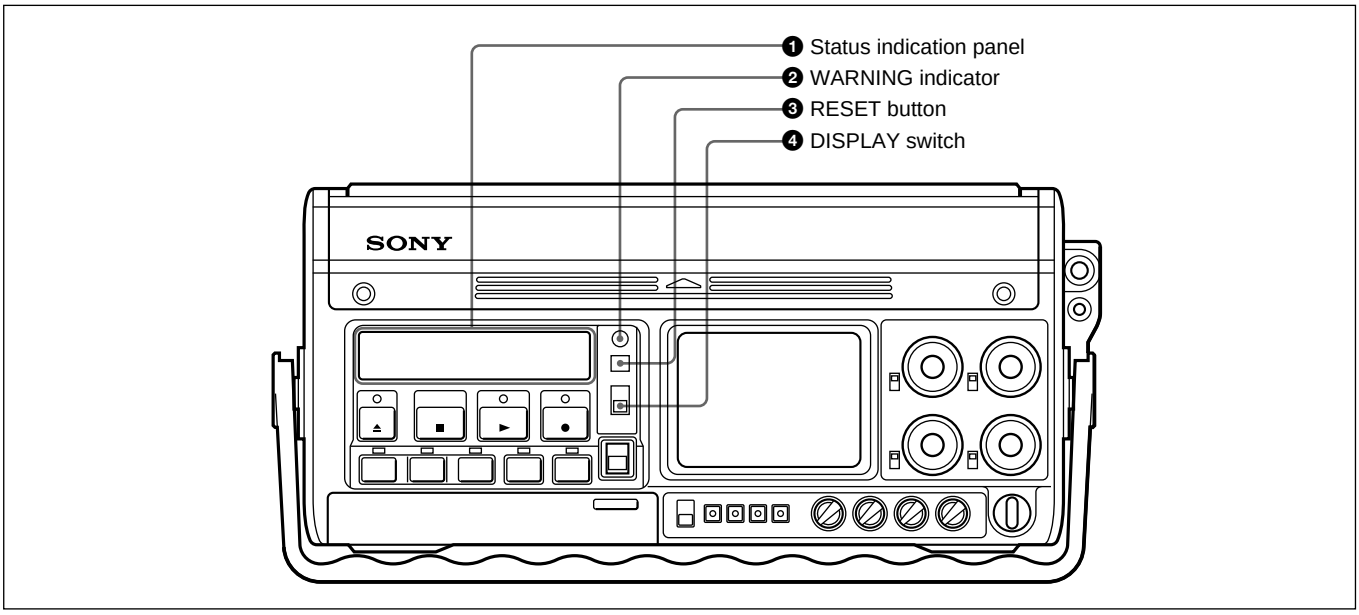
1) EOS
End Of Source: The point where the last recording ended.

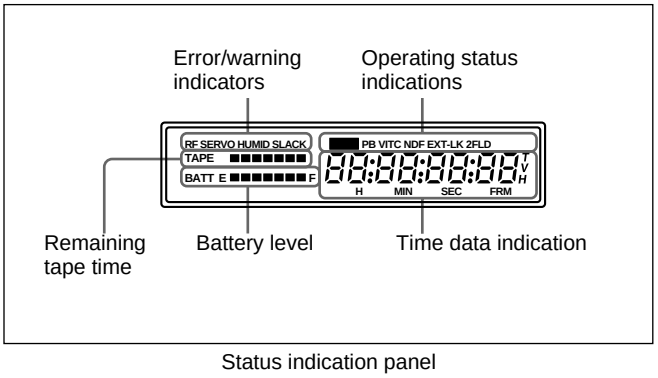
2-1-2 Status Indications



Status indications

1 Status indication panel

Displays error/warning indicators, the tape remaining, battery level, VTR operating status, and time data.



Status indication panel

The displayed indications have the following meanings:

Error/warning indicators

The following indicators appear when an operational error has occurred or a warning is issued.

RF: Recording or playback is not possible due to clogged video heads or circuit failure.

SERVO: The drum servo or capstan servo is not locked.

HUMID: There is condensation on the head drum or the humidity inside the VTR is high.

SLACK: The tape is not wound correctly.

For details, see "Error/Warning Indicators on the Status Indication Panel, WARNING Indicator Conditions, and Warning Beeps" on page A-3.

Operating status indications

The following indications appear to indicate the current status of the VTR.

DIAG: The VTR is in self-diagnostics mode.

PB: Playback time code is displayed.

VITC: VITC (see page 2-9) is displayed.

NDF: Non-drop frame mode (see page 4-10) is selected.

EXT-LK: The time code of the VTR is locked to an external time code generator.

2FLD: The internal time code generator is not color frame locked[1)].

1) **Color frame lock**
The setting of an even time code frame number for the first and second color fields, and an odd number for the third and fourth color fields.

Time data indication
Displays the CTL signal[1] (tape running time), time code, or user's bits[2], depending on the setting by the DISPLAY switch. However, when the REAL TIME REC/SET switch (see page 2-10) is set to SET, the display always shows the actual time regardless of the DISPLAY switch setting.

Remaining tape time
Displays the amount of time remaining on the tape. Each segment corresponds to 5 minutes of remaining time; if 30 minutes or more remain, all seven segments light up.

For details on the condition of the segments and remaining tape time, see "3-2-4 Checking the Remaining Time on the Tape" on page 3-6.

When the remaining time reaches the 2-minute point, the leftmost segment and TAPE indication start to flash, the WARNING indicator flashes, and a beep sounds intermittently. When the tape comes to the end, the WARNING indicator lights up and the beep sounds continuously.

Battery level
This indication shows the current power level of the battery pack. When the battery pack is fully charged, all seven segments light up. As the battery pack discharges, the segments turns off from right to left.

For details on the condition of the segments and battery level, see "3-1-5 Confirming the Power Source and Voltage" on page 3-4.

When the battery pack is almost exhausted, the leftmost segment, BATT indication, and E indication start to flash, the WARNING indicator flashes, and a beep sounds intermittently. When the battery is completely exhausted, the WARNING indicator lights up and the beep sounds continuously.

❷ WARNING indicator
This indicator lights up or flashes when less than 2 minutes remain on the tape, the battery pack is almost exhausted, or an operational failure has occurred.

For details, see "Error/Warning Indicators on the Status Indication Panel, WARNING Indicator Conditions, and Warning Beeps" on page A-3.

❸ RESET button
Press this button to reset the time data indication. When CTL is selected, the indication resets to "0:00:00:00"; when other types of time data are selected, the indication resets to "00:00:00:00."

❹ DISPLAY switch
Selects the time value to be displayed.
CTL: Tape running time is displayed in hours, minutes, seconds, and frames with each item separated by a colon (:).
TC: Time code is displayed.
U-BIT: User's bits are displayed. When user's bits are selected, no colons appear.
The type of time data that is displayed is, however, not determined by the DISPLAY switch only. The REAL TIME REC/SET switch (see page 2-10) setting takes first priority, followed by the F-RUN/R-RUN switch (see page 2-10) setting, and finally the DISPLAY switch setting.

Switch settings and the time data displayed

REAL TIME REC/SET switch	F-RUN/R-RUN switch	DISPLAY switch	Time data displayed
SET	Ignored	Ignored	Actual time
REC ON or OFF	SET	TC or CTL	Time code
		U-BIT	User's bits
	F-RUN or R-RUN	CTL	CTL
		TC	Time code
		U-BIT	User's bits

1) CTL signal
This is a control signal consisting of a pulse signal recorded horizontally on the tape.

2) User's bits
Consisting of eight characters (including numbers and the letters A to F), user's bits form a part of the time code, and are used to record supplementary information.

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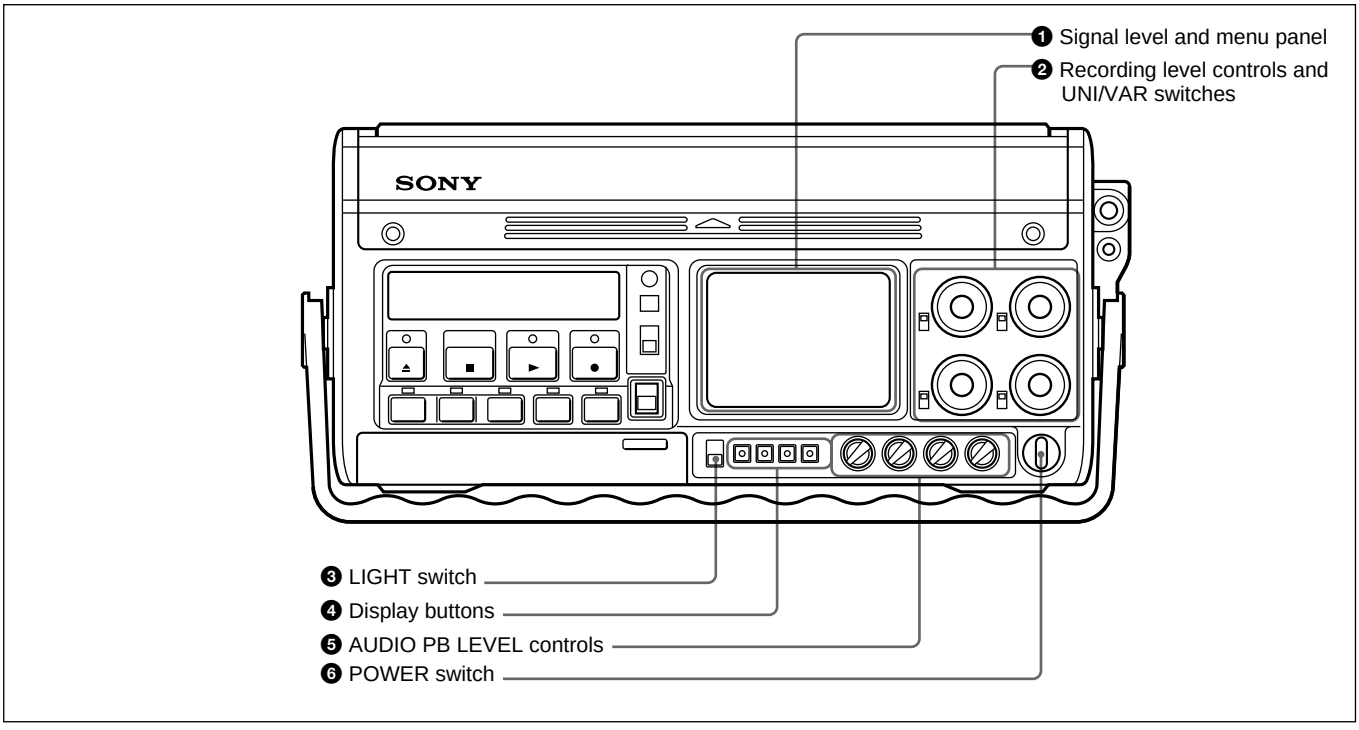
2-1-3 Adjustment Controls


❶ Signal level and menu panel
❷ Recording level controls and UNI/VAR switches
SONY
❸ LIGHT switch
❹ Display buttons
❺ AUDIO PB LEVEL controls
❻ POWER switch

Adjustment controls

❶ Signal level and menu panel

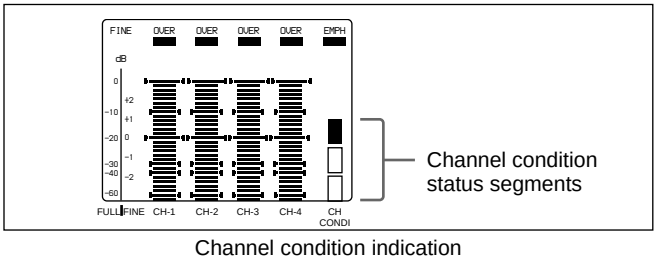
Each time the DISPLAY button (one of the display buttons) is pressed, audio level meters, video level meters, setup menu, and INFORMATION screen appear one at a time (factory setting).

When audio level meters appear in the display, the playback signal condition is indicated by the three segments above the CH CONDI (channel condition) indication.

Top segment Lights up to indicate that the playback signal is normal with no degradation.

Middle segment Lights up to indicate that the playback signal is somewhat degraded, but still adequate.

Bottom segment Lights up to indicate that the playback signal is degraded. If this segment lights up continuously, head cleaning or an internal check is required.



Channel condition indication

To select the items displayed when the DISPLAY button is pressed

Items other than the audio level meters and setup menu can be turned on or off by setting DISP SEL in the SYSTEM menu (see page 7-13).

❷ Recording level controls and UNI/VAR (unity/variable) switches

When analog audio signals are input, turn these controls to adjust the recording level of each of the four channels. Each control has a UNI/VAR switch, whose position affects the recording level as follows:

UNI: The input signal is recorded as is, and is unaffected by the recording level control.

VAR: The recording level can be adjusted by turning the recording level control.

❸ LIGHT switch

Use this switch to turn on or off the back light in the status indication panel (see page 2-5) and the signal level and menu panel, and to adjust the brightness of the indicators of the operation controls (see page 2-2).

ON: Turns the backlight on.

OFF: Turns the backlight off.

BRT: Turns the backlight off and increases the brightness of the indicators of the operation controls (to make the indicators easier to see, for example outdoors).

❹ Display buttons

These four buttons have functions that depend on the current status of the signal level and menu panel (see page 2-7). The audio level meters and the setup menu are factory-set so that they always appear by pressing the DISPLAY button repeatedly. Display or non-display of all other items can be set independently by using DISP SEL in the SYSTEM menu (see page 7-13). The items which are set to be displayed appear alternately each time the DISPLAY button is pressed. The functions of the buttons are shown in the following table:

❺ AUDIO PB (playback) LEVEL controls

Turn to adjust the playback levels of the channels output to the HD SDI OUT connector (see page 2-15) and AUDIO OUT connectors (see page 2-13). The adjustment is effective only when PB VOLUME in the AUDIO menu is set to VAR (see page 7-12).

❻ POWER switch

Turns the VTR on or off.

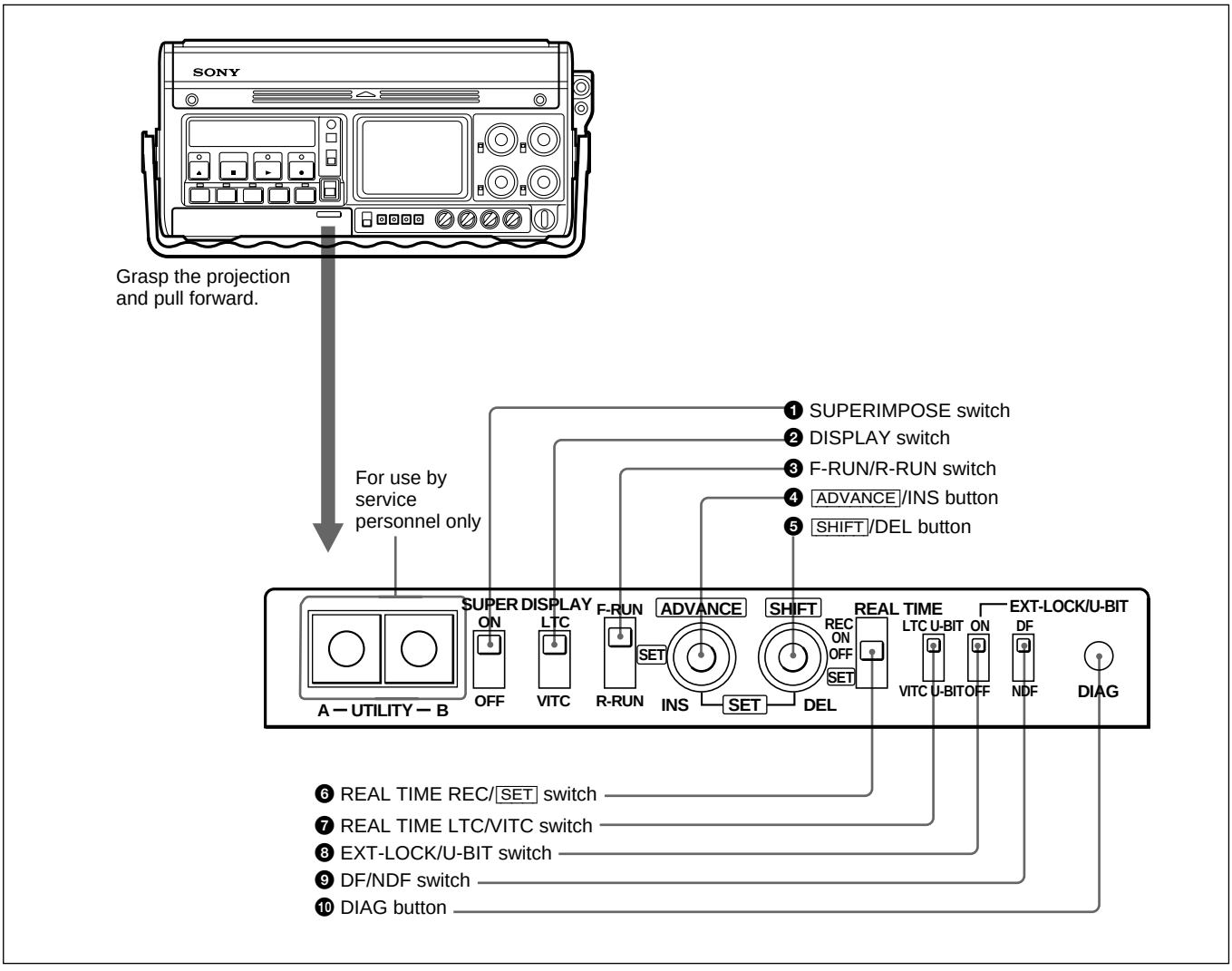
This switch also controls the power supply to the camera connected to the CAMERA connector (see page 2-15) and the remote controller connected to the CAMERA REMOTE connector (see page 2-16).

Functions of the display buttons

Display item / Display buttons	Audio level meters	Video level meters	Setup menu	INFOR-MATION screen	TELE FILE menu[1)]	Error log[1)]	RF CHECK screen[1)]	CHANNEL (channel condition) screen[1)]
DISPLAY button	Changes to the next item	Changes to the setup menu	Changes to the next item	Changes to the next item	Changes to the next item	Changes to the next item	Changes to the next item	Changes to the audio level meters
UP button	No change	No change	Moves the cursor (*) up	No change	Selects the upper cue point	Selects the upper log	No change	No change
DOWN/FREEZE button	Freezes the playback picture or cancels the freeze	No change	Moves the cursor (*) down	Freezes the playback picture or cancels the freeze	Selects the lower cue point	Selects the lower log	No change	No change
SET/FINE/SEARCH button	Changes the display mode (between FULL and FINE)	No change	Selects the item with the cursor (*)	No change	Locates the selected cue point	Switches the detailed display of the selected item	No change	No change

1) These items are factory-set so that they do not appear when the DISPLAY button is pressed. To display these items, use DISP SEL in the SYSTEM menu (see page 7-13).

2-1-4 Time Code Setting Controls



Time code setting controls

❶ SUPERIMPOSE switch

Specifies whether or not information on the status of the VTR (PLAY, FF, etc.) and time code values are superimposed on the video signal output from the COMPOSITE MONITOR OUT connector and ANALOG HD COMPONENT MONITOR OUT connector (see page 2-15).

ON: Information is superimposed.

OFF: Information is not superimposed.

❷ DISPLAY switch

Selects the time code displayed in the status indication panel (see page 2-5). The switch operation is effective only when the DISPLAY switch beside the status indication panel (see page 2-6) is set to TC or U-BIT.

LTC: LTC[1] is displayed.

VITC: VITC[2] is displayed.

---

1) LTC (Longitudinal Time Code)

A time code that is recorded on a longitudinal track on the tape. LTC cannot be read when the tape playback speed is slow or changing rapidly.

2) VITC (Vertical Internal Time Code)

A time code signal that is inserted on two lines in the vertical blanking interval. This allows the time code to be read even during very slow playback or still-picture playback.

❸ F-RUN/R-RUN (free-run/record-run) switch
Selects the operation mode of the internal time code generator.

F-RUN: The time code generator continues running regardless of the operating status of the VTR. Select this position when setting the time code to actual time or synchronizing it to an external time code.

SET: Select this position when setting the time code or user's bits.

R-RUN: The time code generator runs only when the VTR is recording. This produces a tape with consecutive time code values, even when recording is done intermittently.

❹ ADVANCE/INS (insert) button

Setting the time code or user's bits

Each press of this button increases the digit selected by pressing the SHIFT/DEL button (the digit flashes). This button is operational only when the F-RUN/R-RUN switch or the REAL TIME REC/SET switch is set to SET.

Inserting a cue point while in the TELE FILE menu

Press the ADVANCE/INS button while pressing down the ENTER button (see page 2-4).

❺ SHIFT/DEL (delete) button

Setting the time code or user's bits

Each press of this button selects the next digit in succession. The selected digit flashes, indicating that it can be changed. This button is operational only when the F-RUN/R-RUN switch or the REAL TIME REC/SET switch is set to SET.

Deleting a cue point while in the TELE FILE menu

Press the SHIFT/DEL button while pressing down the ENTER button (see page 2-4).

❻ REAL TIME REC (record)/SET switch
Specifies whether or not the actual time is recorded as user's bits. This switch is also used for setting the actual time.

REC ON: Records actual time as user's bits.

REC OFF: Does not record actual time as user's bits.

SET: Sets the actual time.

❼ REAL TIME LTC/VITC switch
Specifies whether or not the actual time is inserted as user's bits in the LTC or VITC.

LTC U-BIT: The actual time is inserted into the user's bits in the LTC.

VITC U-BIT: The actual time is inserted into the user's bits in the VITC.

❽ EXT-LOCK (external lock)/U-BIT (user's bits) switch
Specifies whether or not user's bits are locked to external user's bits.

ON: The user's bits are locked to the user's bits value inserted in the external time code.

OFF: The user's bits value set on the VTR is used.

❾ DF (drop frame)/NDF (non-drop frame) switch
Specifies whether to use drop frame mode or non-drop frame mode (see the footnote on page 4-10).

DF: Drop frame mode is used.

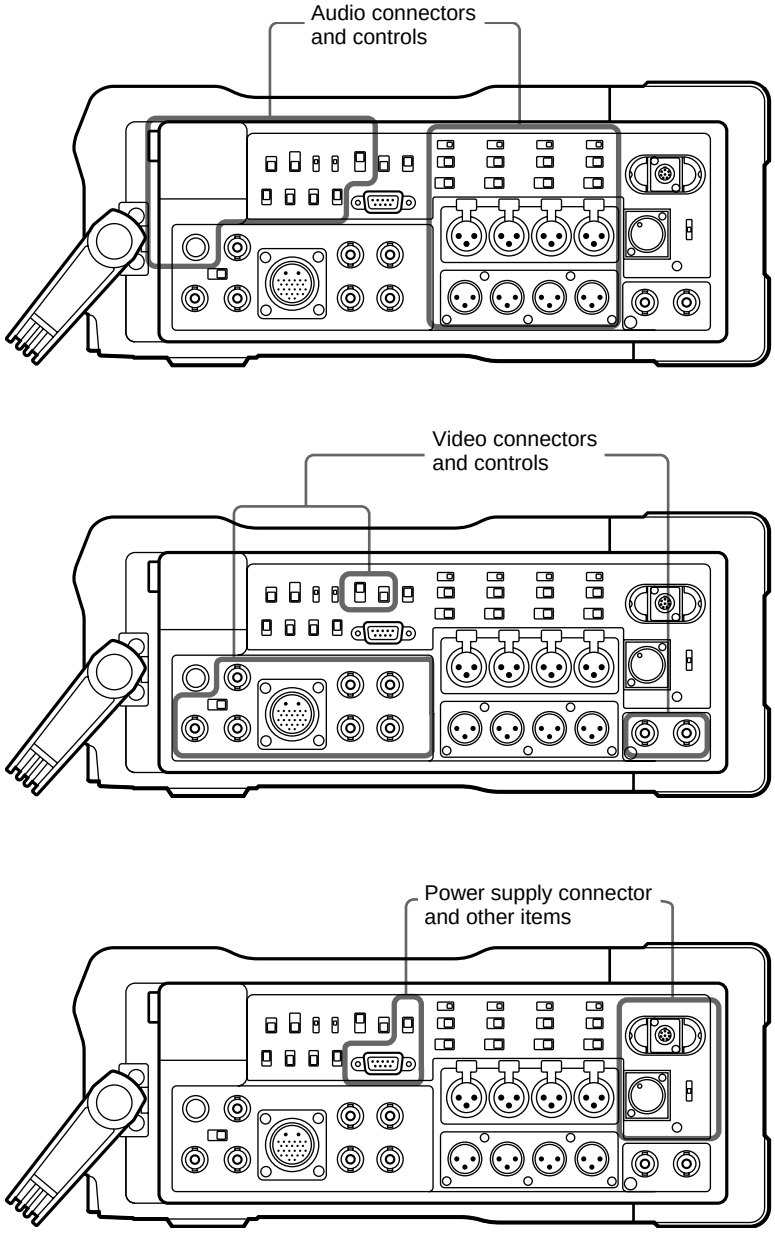
NDF: Non-drop frame mode is used.

❿ DIAG (diagnosis) button
Press to carry out a self-diagnosis on the VTR.

For details, refer to the maintenance manual part 1 (supplied).

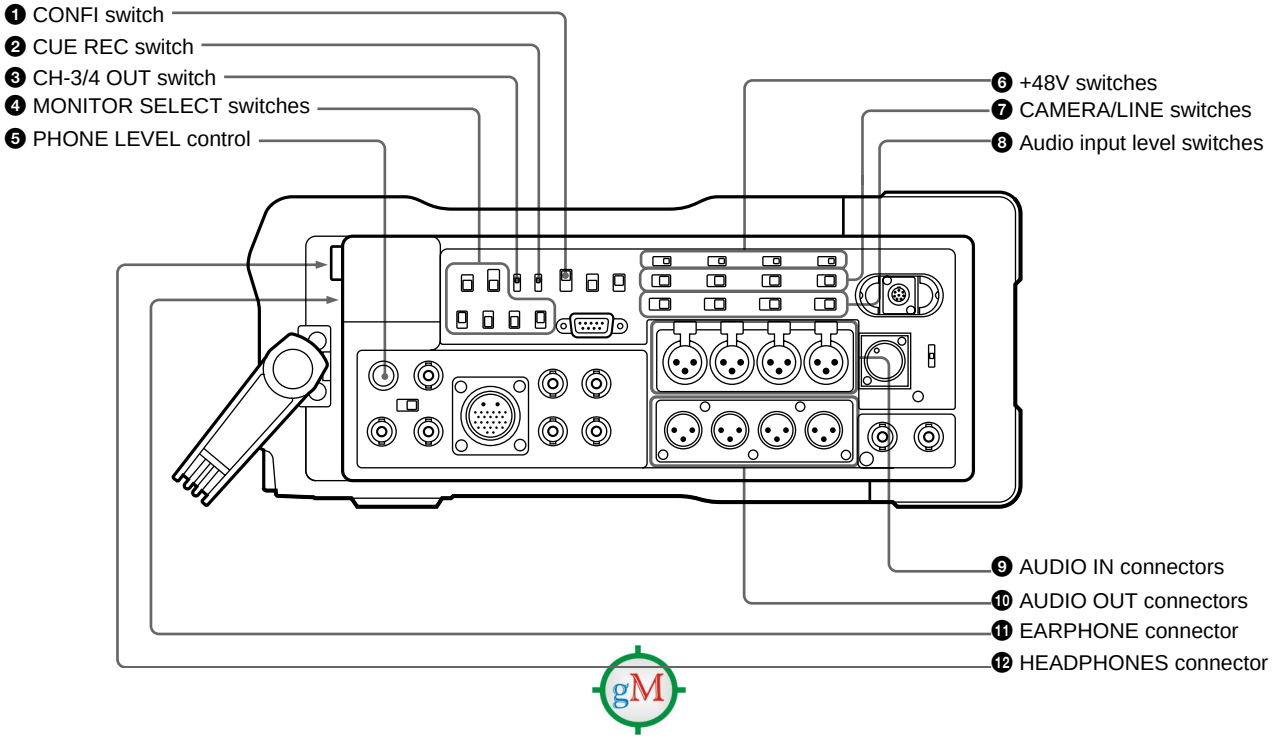
2-2 Connector Panel

The connector panel is divided into the three following sections:
- Audio connectors and controls
- Video connectors and controls
- Power supply connector and other items



Connector panel

2-2-1 Audio Connectors and Controls



Audio connector and controls

❶ CONFI (confidence) switch

Selects the monitoring mode for recording. The selection made by this switch applies to both video and audio signals.

ON: The signal being recorded is simultaneously played back for monitoring.

Note

When the recording of the input signal from the camera is synchronized with an external reference signal, the E-E signal is used for monitoring.

ECC (Error Correcting Codes): The input signal is monitored as is in E-E mode. If a serious error is detected while recording, an error message appears in the signal level and menu panel.

OFF: The input signal is monitored as is in E-E mode. The RF envelope is monitored during recording, and if an error occurs, an error message appears in the signal level and menu panel.

To reduce power consumption

The ON setting results in the highest power consumption, and the OFF setting the lowest. When using the VTR with a battery pack, set this switch to ECC or OFF.

❷ CUE REC (record) switch

Analog audio input signals can be mixed and recorded on the analog cue track on the tape. The switch position determines whether or not the signals are recorded on the cue track during normal recording. When the switch is set to ON, the analog audio input signals of channels 1 to 4 are mixed and recorded on the cue track.

❸ CH-3/4 (channels 3 and 4) OUT (output) switch

Selects the signal to be output from the AUDIO OUT 3 and 4 connectors (see page 2-13).

MON: The signals selected by the MONITOR SELECT switches are output.

LINE: The signals of audio channels 3 and 4 are output.

❹ MONITOR SELECT switches
These switches select the audio signals which can be monitored through the EARPHONE connector and HEADPHONES connector. When the CH-3/4 OUT switch is set to MON, these switches also select the audio signal output for AUDIO OUT 3 and 4 connectors.

CUE: The audio from the cue track is monitored.

DA: The audio signals selected by the MONITOR SELECT 1/2 3/4 MIX switch are output.

1/2: Audio from the AUDIO OUT 1 and 2 connectors

3/4: Audio from the AUDIO OUT 3 and 4 connectors

MIX: A mixed signal consisting of signals from the four channels selected by the switches (set to ON) below the MONITOR SELECT 1/2 3/4 MIX switch).

❺ PHONE LEVEL control
Rotate to adjust the audio output of the EARPHONE and HEADPHONES connectors.

❻ +48V switches
These switches turn on or off the 48 V microphone phantom power supply to the corresponding AUDIO IN connectors. These switches operate only when the following settings are made for the corresponding AUDIO IN connectors:

CAMERA/LINE switch LINE position
Audio input level switch –60 position

❼ CAMERA/LINE switches
These switches select the input signal for each of the four AUDIO IN connectors.

CAMERA: The audio input from the CAMERA connector (see page 2-15) is selected.

LINE: The audio input from the corresponding AUDIO IN connector is selected.

❽ Audio input level switches
These switches control the input level for the corresponding AUDIO IN connectors. –60, –20, and +4 (dBu) can be selected.

When the corresponding CAMERA/LINE switch is set to CAMERA
Set the switch to –20.

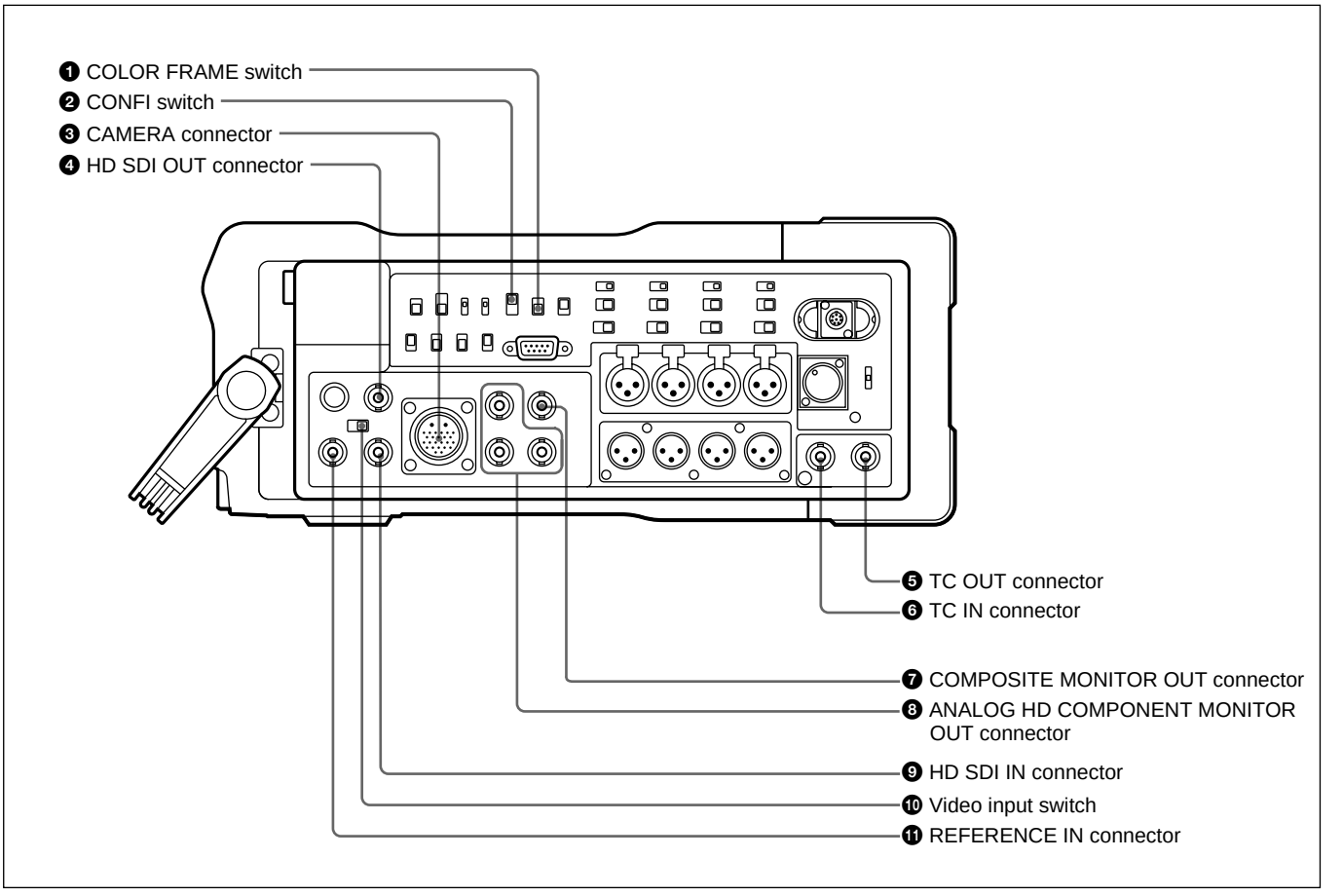
❾ AUDIO IN connectors (XLR, 3-pin)
These connectors allow up to four analog audio signals to be input from external microphones or other devices.

❿ AUDIO OUT connectors (XLR, 3-pin)
Output up to four analog audio signals to external devices.

⓫ EARPHONE connector (stereo minijack)
Use this connector to attach an earphone or stereo headphones equipped with a stereo miniplug. Select the signal to be monitored by setting the MONITOR SELECT switches. If the WARNING indicator (see page 2-6) lights up or flashes, a warning sound is output to the earphone.

⓬ HEADPHONES connector (stereo standard jack)
Use this connector to attach stereo headphones with an impedance of 8 ohms. Select the signal to be monitored by setting the MONITOR SELECT switches. If the WARNING indicator (see page 2-6) lights up or flashes, a warning sound is output to the headphones.

2-2-2 Video Connectors and Controls


❶ COLOR FRAME switch
❷ CONFI switch
❸ CAMERA connector
❹ HD SDI OUT connector
❺ TC OUT connector
❻ TC IN connector
❼ COMPOSITE MONITOR OUT connector
❽ ANALOG HD COMPONENT MONITOR OUT connector
❾ HD SDI IN connector
❿ Video input switch
⓫ REFERENCE IN connector

Video connector and controls

❶ COLOR FRAME switch

Enables or disables color framing during editing or playback.

ON: Color framing is enabled. Playback is always in units of four fields.

OFF: Color framing is disabled. Playback is always in units of two fields.

❷ CONFI (confidence) switch

Selects the monitoring mode during recording. The setting of this switch applies to both video and audio signals.

ON: The signal being recorded is simultaneously played back for monitoring.

Note

When the recording of the input signal from the camera is synchronized with an external reference signal, the E-E signal is used for monitoring.

ECC (Error Correcting Codes): The input signal is monitored as is in E-E mode. If a serious error is detected while recording, an error message appears in the signal level and menu panel.

OFF: The input signal is monitored as is in E-E mode. The RF envelope is monitored during recording, and if an error occurs, an error message appears in the signal level and menu panel.

To reduce power consumption

The ON setting results in the highest power consumption, and the OFF setting the lowest. When using the VTR with a battery pack, set this switch to ECC or OFF.

❸ CAMERA connector (26-pin)
Connects to the multi-pin connector on the HD video camera for the transmission of video, audio, and control signals between the two units.
When CAM POWER in the SYSTEM menu is set to ON (see page 7-13), the VTR supplies power to the camera. When the video input switch is set to CAMERA, the signals input through this connector are the video input to the VTR.

❹ HD SDI (high-definition serial digital interface) OUT connector (BNC)
Outputs the HD SDI video/audio signals. This output can be turned on or off by SDI OUT in the VIDEO (HD) menu (see page 7-10).

❺ TC (time code) OUT connector (BNC)
Connects to the time code input connector of an external device such as a time code reader or VTR. The time code output is determined by the setting of TC OUT in the TIME CODE menu (see page 7-7) as follows:

GEN: Time code generated by the internal time code generator is output.

AUTO: During recording (including E-E mode), time code generated by the internal time code generator is output. During playback, the LTC signal from the tape is output.

❻ TC (time code) IN connector (BNC)
Connects to the time code output connector of an external device such as a time code generator or VTR. Use this connector when locking the internal time code generator to an external time code.

❼ COMPOSITE MONITOR OUT connector (BNC)
Outputs an NTSC analog composite signal for monitoring. The output from this connector can be turned on or off by D CONV. OUT in the VIDEO (NTSC) menu (see page 7-11). Information on the status of the VTR (PLAY, FF, etc.) and time code values may be superimposed onto the signal output from this connector by setting the SUPERIMPOSE switch to ON (see page 2-9).
When the field frequency of this VTR is set to 60 Hz, no signal is output from this connector. Set FREQUENCY in the SYSTEM menu to 59.94 (see page 7-14).

❽ ANALOG HD (high-definition) COMPONENT MONITOR OUT connector (Y, P_B, P_R)
Outputs a high-definition analog component signal for monitoring. Information on the status of the VTR (PLAY, FF, etc.) and time code values may be superimposed onto the signal output from this connector by setting the SUPERIMPOSE switch to ON (see page 2-9).

❾ HD SDI (high-definition serial digital interface) IN connector (BNC)
Inputs the HD SDI video/audio signals. When video input switch is set to SDI IN, the signal supplied to this connector is the video input to the VTR.

❿ Video input switch
The position of this switch determines the video signal input to the VTR.

CAMERA: The component video signal input from the CAMERA IN connector is the input signal.

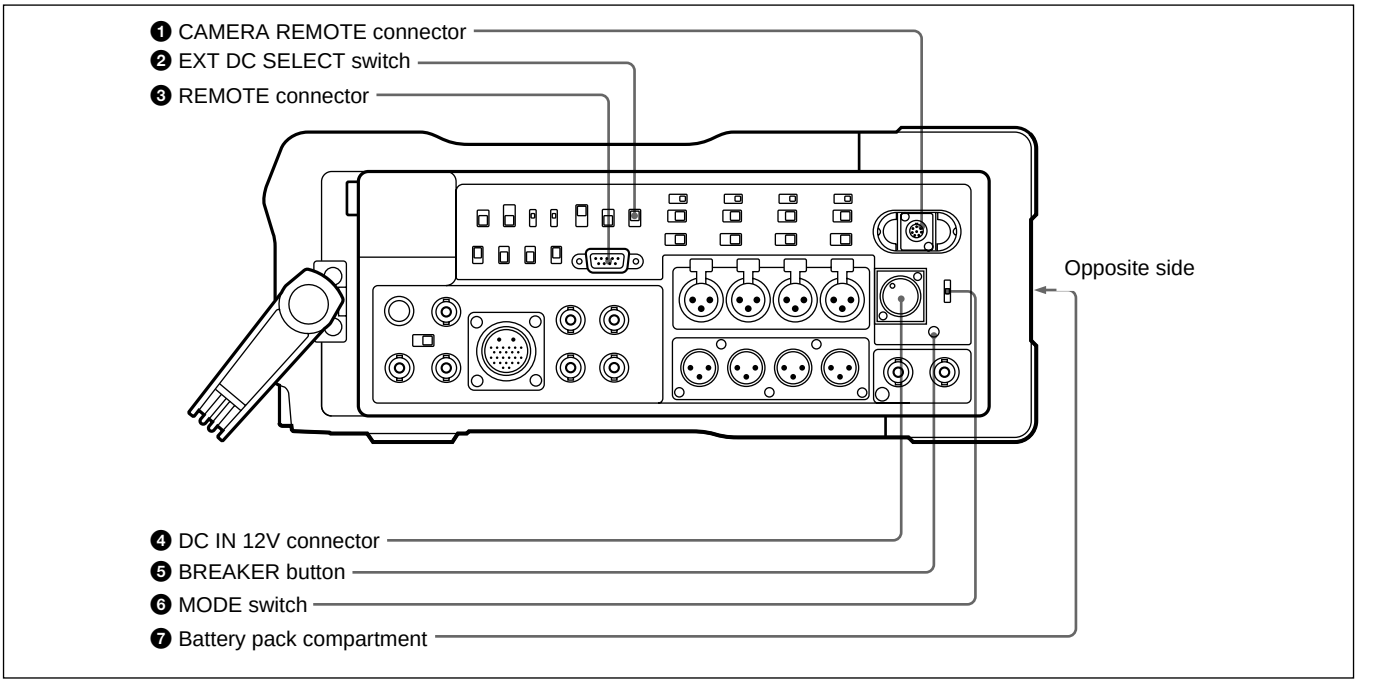
SDI IN: The HD SDI signal input from the HD SDI IN connector is the input signal.

⓫ REFERENCE IN connector (BNC)
Accepts a reference video signal with a scanning frequency and field frequency of 1125/59.94, 1125/60, or 525/59.94. When using the HD standard video signal, be sure to input a trilevel sync signal; when using the NTSC standard video signal, be sure to input a video signal with a chroma burst signal (VBS) or black and white video signal (VS).

Note

Set FREQUENCY in the SYSTEM menu according to the field frequency of the input reference signal (see page 7-14).

2-2-3 Power Supply Connector and Other Items



Power supply connector and other items

❶ CAMERA REMOTE connector (8-pin)
Connects the RM-B150 Remote Controller and other remote controllers for the control of the VTR and the camera connected to the VTR. The VTR supplies power to the remote controller through this connector. Use CAM REMOT in the SYSTEM menu (see page 7-14) to select the communication protocol.

❷ EXT (external) DC SELECT switch
Specifies the operating parameters for the external power supply connected to the DC IN 12V connector.

AUTO: The VTR uses the external power supply, but switches to the internal battery pack automatically if the power supply voltage drops.

EXT: The external power supply is always used.

❸ REMOTE connector (9-pin)
Connects an external remote controller that supports the Sony 9-pin protocol, ISR or external personal computer for TELE FILE menu operations, etc., for controlling the VTR. Set REMOTE in the SYSTEM menu (see page 7-14) to specify which interface the connector will be used as.

❹ DC IN 12V connector (XLR, 4-pin, male)
When using the AC-550/AC-DN2A AC Adaptor to connect to an AC power source, connect the DC cable of the adaptor to this connector.

❺ BREAKER button
When a power surge occurs in the VTR, the breaker activates and cuts off the power. The button pops out at this time. Do an internal examination of the VTR. If the problem is not a persistent one, push in the button. If the system has returned to normal, power will be restored.

❻ MODE switch
Specifies the output signals and the power consumption.

SAVE: Power consumption is considerably reduced. Set the switch to this position when using a battery pack.

PB/EE: E-E mode signals are output when the VTR is stopped, fast-forwarding, or rewinding.

PB: Video and audio signals recorded on the tape are output when the VTR is stopped, fast-forwarding, or rewinding. (Depending on the playback conditions, video and audio signals may not be output correctly.)

❼ Battery pack compartment
Insert the BP-90A/BP-L60A Battery Pack into this compartment, which is located behind the cover on the opposite side of the connector panel.

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3-1 Power Supply

The VTR can be powered by any of the following sources:
- BP-90A Nickel-cadmium Battery Pack
- BP-L60A Lithium Ion Battery Pack
- Power supplied to the DC IN 12V connector (e.g., from an AC-550/AC-DN2A AC Adaptor).

3-1-1 Using a Battery Pack

Using the BP-90A Battery Pack

Note

The capacity of the BP-90A is not sufficient to supply power to the camera.

For details on powering the camera, see "3-1-3 Turning the Power Supply to the Camera From the VTR On or Off" on page 3-3.

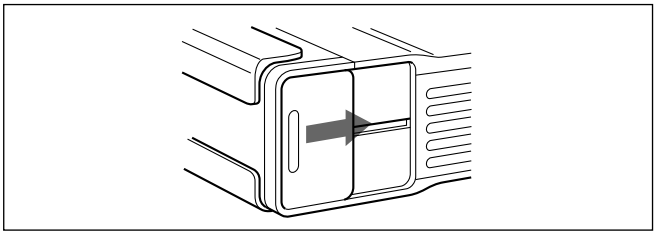
A BP-90A Battery Pack provides about 80 minutes of continuous recording (when the MODE switch is set to SAVE, the CONFI switch to OFF, and both SDI OUT in the VIDEO (HD) menu and D.CONV OUT in the VIDEO (NTSC) menu to OFF (see pages 7-10 and 11)).
Before using the battery pack, charge is with the BC-410 Battery Charger. Charging takes about two hours and thirty minutes.

For details on charging the battery pack, refer to the operation manual supplied with the BC-410 Battery Charger.

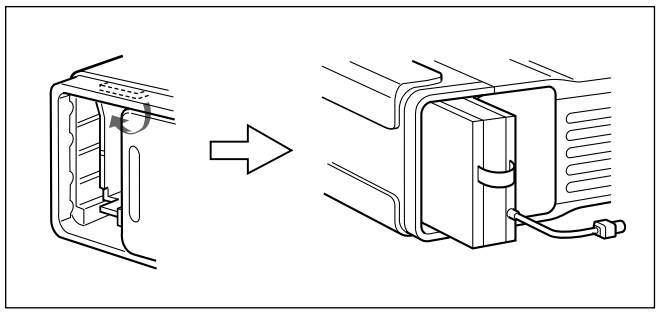
Inserting the BP-90A Battery Pack

Do the procedure below to insert the battery pack.
The sticker included at the end of this manual provides information on changing the battery pack. Attach the sticker to the battery pack compartment cover for your reference.

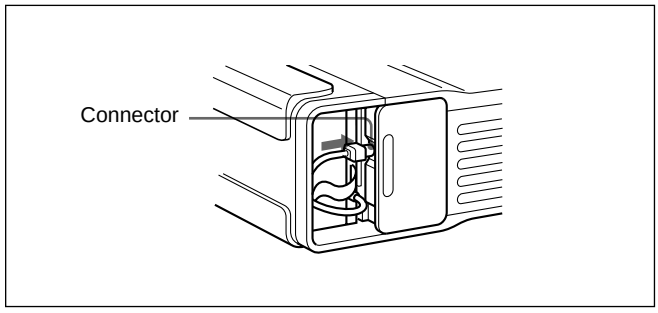
1 Open the battery pack compartment cover on the VTR.



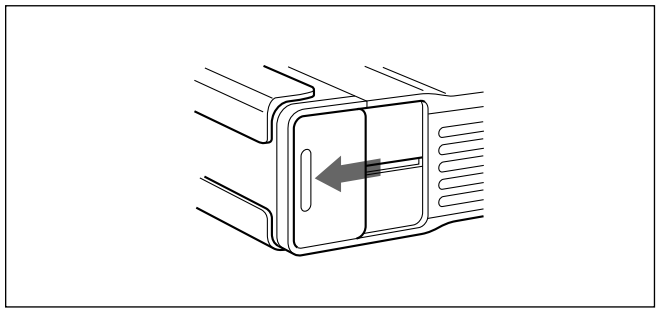
2 Pull down the divider inside the battery compartment, and then insert the battery pack with the cord facing towards you.



3 Attach the cord to the connector inside the battery compartment, and then tuck the cord completely into the compartment.



4 Close the battery pack compartment cover.



If you will not use the VTR for a long time

Be sure to remove the battery pack.

Using the BP-L60A Battery Pack

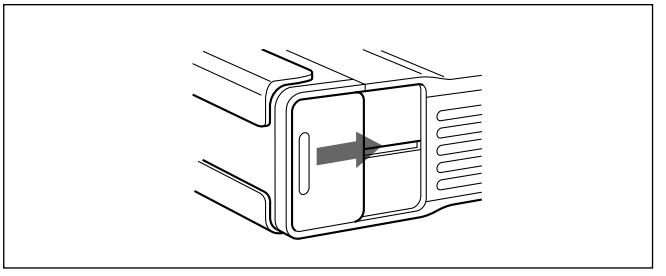
The BP-90A Battery Pack provides about 80 minutes of continuous recording (when the MODE switch is set to SAVE, the CONFI switch to OFF, and SDI OUT in the VIDEO (HD) menu, D.CONV OUT in the VIDEO (NTSC) menu, and CAM POWER in the SYSTEM menu are set to OFF (see pages 7-10, 11, and 12)). Before using the battery pack, charge it with the BC-L100 Battery Charger. Charging takes about two hours and thirty minutes.

For details on charging the battery pack, refer to the operation manual supplied with the BC-L100 Battery Charger.

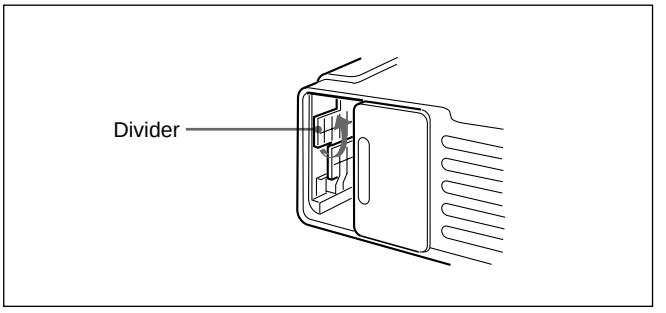
Inserting the BP-L60A Battery Pack

Do the procedure below to insert the battery pack. The sticker included at the end of this manual provides information on changing the battery pack. Attach the sticker to the battery pack compartment cover for your reference.

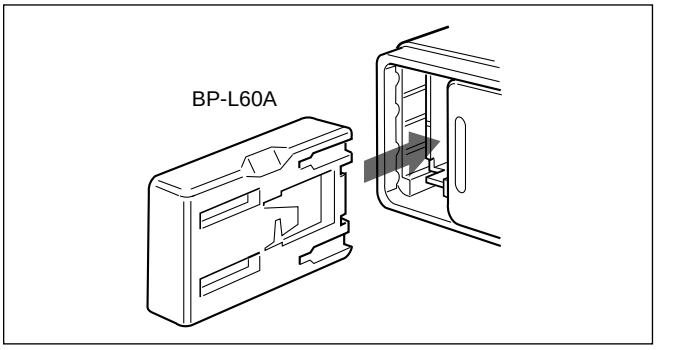
1 Open the battery pack compartment cover on the VTR.



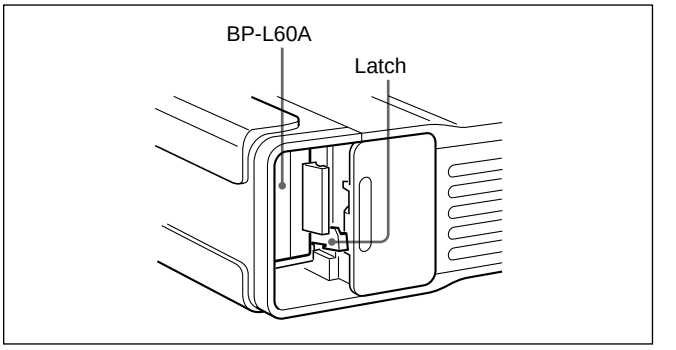
2 Pull up the divider inside the battery compartment.



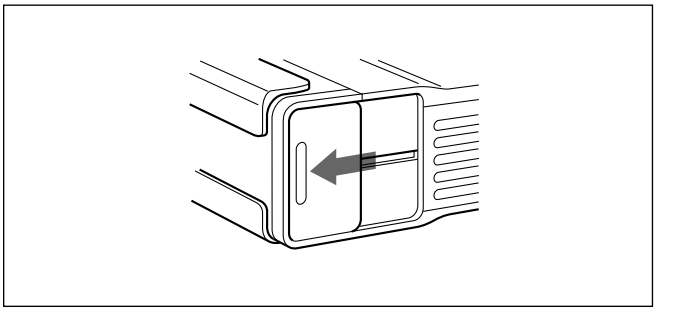
3 Insert the battery pack with the bottom facing inward, and push it until it clicks into place.



When the battery pack is inserted correctly, the latch automatically engages.



4 Close the battery pack compartment cover.

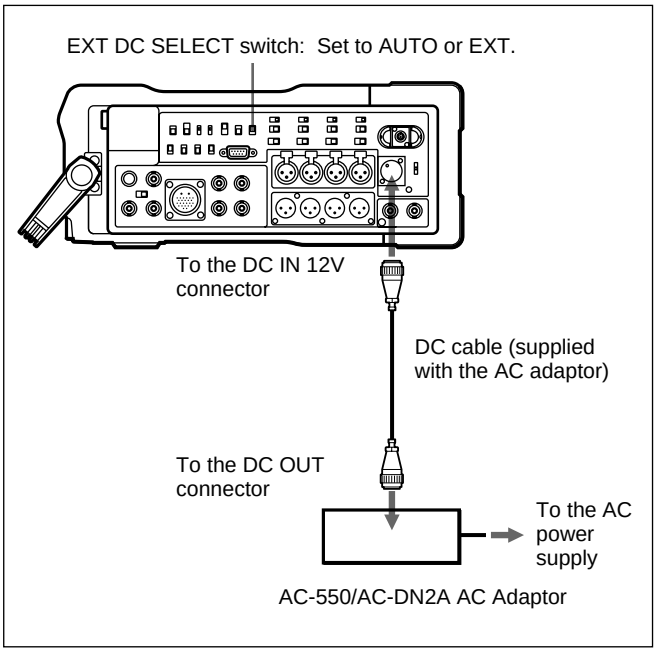


If you will not use the VTR for a long time

Be sure to remove the battery pack.

3-1-2 Using the AC Power Supply

Do the following procedure to power the VTR from an AC power supply.


EXT DC SELECT switch: Set to AUTO or EXT.
To the DC IN 12V connector
DC cable (supplied with the AC adaptor)
To the DC OUT connector
To the AC power supply
AC-550/AC-DN2A AC Adaptor

Using the AC power supply

1 Turn off the HDW-250.

2 Connect the DC IN 12V connector on the HDW-250 to the AC-550/AC-DN2 AC Adaptor, and the adapter to the AC power supply, as shown in the figure above.

For details, refer to the operation manual supplied with the AC adaptor.

3 Set the EXT DC SELECT switch to either of the following positions:

AUTO: The VTR uses the external power supply, but switches to the internal battery pack automatically if the voltage drops.

EXT: The external power supply is always used.

4 Turn on the AC adaptor.

3-1-3 Turning the Power Supply to the Camera From the VTR On or Off

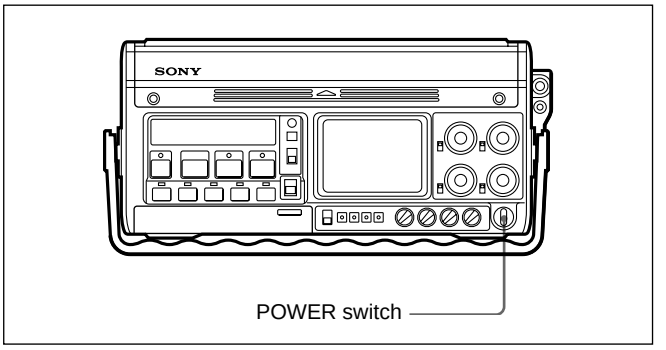
Use CAM POWER in the SYSTEM menu (see page 7-13) to specify whether power is supplied to the camera from the VTR.

Note

When supplying power to the camera from the VTR, if the camera's power consumption exceeds the VTR's power supplying capacity (5 amperes maximum), the VTR's internal fuse may blow. Use another power supply for the camera whenever possible.
The following should be kept in mind when power must be supplied to the camera from the VTR due to the shooting conditions:

- **When using the BP-90A Battery Pack**
  The BP-90A does not have enough power to supply power to the camera. If CAM POWER in the SYSTEM menu (see page 7-13) is changed to ON while the BP-90A is being used, the WARNING indicator flashes and a beep sounds intermittently. If recording continues, the power supply changes to the battery pack and the intermittent beep changes to a continuous beep. The power to the camera is then forcibly cut off. To supply power to the camera from the battery pack with CAM POWER in the SYSTEM menu (see page 7-13) set to ON, change to the external power supply by setting the EXT DC SELECT switch to EXT, and replace the current BP-90A Battery Pack with the BP-L60A Battery Pack.
- **When using the BP-L60 Battery Pack**
  The maximum continuous discharge current of the BP-L60 is 7 amperes, which is enough to supply power to the VTR alone, but not enough to power the camera as well. To supply power to both VTR and camera, use a BP-L60A, which has a maximum continuous discharge current of 10 amperes and allows approximately 15 minutes of continuous recording.
- **When using an AC-550/AC-DN2 AC Adaptor**
  The maximum power output of the AC-550 is 94 watts, which is enough to power the VTR, but not enough power to power the camera as well. To supply power to both VTR and camera, use the AC-DN2, which has a maximum power output of 150 watts.

3-1-4 Turning Power of the VTR On or Off



Set the POWER switch to ON or OFF.

3-1-5 Confirming the Power Source and Voltage

Confirming the power source being used

Press the DISPLAY button (one of the display buttons) repeatedly to select the INFORMATION screen in the signal level and menu panel. DC IN appears in the INFORMATION screen when the VTR is being powered by an external power supply; BATT appears when the VTR is being powered by a battery pack.

For details, see "4-1-3 Checking the VTR Status" on page 4-3.

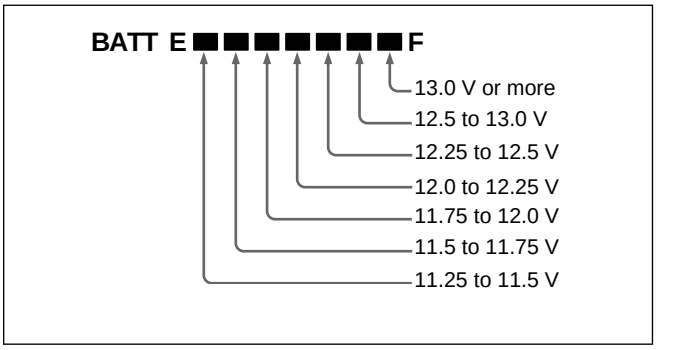
Confirming the voltage of the power source

You can confirm the voltage of the power source being used in the following two ways:

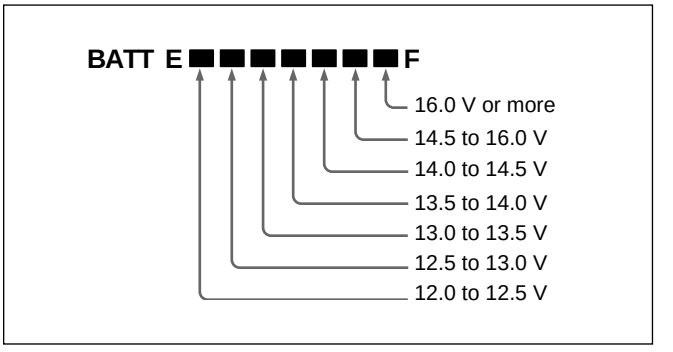
Using the status indication panel

The battery voltage is indicated by the battery level indication in the status indication panel. When the battery is fully charged (13 volts or more for the BP-90A and 16 volts or more for the BP-L60A), all seven segments light up.

The relationship between the number of segments and the battery pack voltage is shown in the following figures:



Display segments and battery pack voltage (BP-90A or external power supply)



Display segments and battery pack voltage (BP-L60A)

As the battery pack becomes weak, the segments turns off from right to left. When the battery pack is almost exhausted, the leftmost segment, BATT indication, and E indication start to flash, the WARNING indicator flashes, and a warning beep sounds intermittently. When the battery is completely exhausted, the WARNING indicator lights up and the warning beep sounds continuously.

Using the DISPLAY button

Press the DISPLAY button (one of the display buttons) repeatedly to select the INFORMATION screen in the signal level and menu panel. The power source being used and its voltage are displayed.

DC IN XX.X (XX.X): The external power supply is being used. The value without the parentheses to the right of the DC IN indication is the voltage of the external power supply, and the value in the parentheses is the voltage of the battery pack.

BATT XX.X (XX.X): The battery pack is being used. The value without the parentheses to the right of the BATT indication is the voltage of the battery pack, and the value in the parentheses is the voltage of the external power supply.

For details, see "4-1-3 Checking the VTR Status" on page 4-3.

3-2 Cassettes

This section lists the cassette which can be used and provides information on their handling.

3-2-1 Cassette Types

Use HDCAM cassettes with 1/2-inch tape.

HDCAM cassettes

Cassette size	Maximum recording time
Small cassette	40 minutes
Large cassette	124 minutes

Note

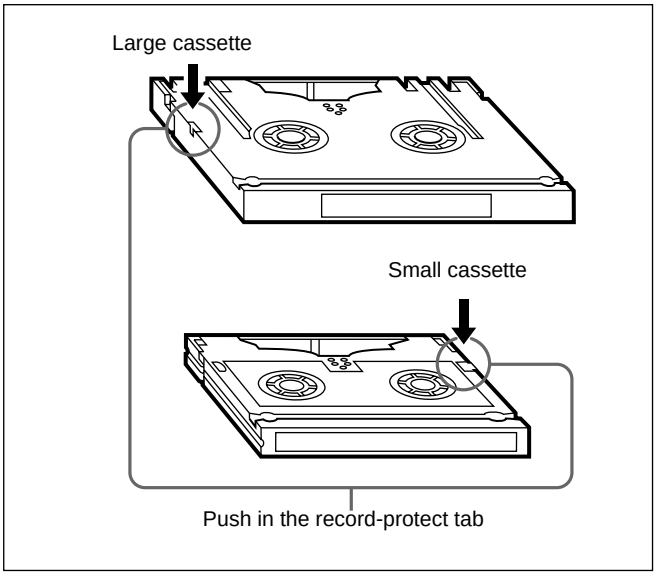
Digital Betacam cassettes cannot be used with this VTR.

Cassette storage

Store the cassettes at a location with normal levels of temperature and humidity.

3-2-2 Preventing Accidental Erasure of Recordings

To prevent accidental erasure of the a cassette, push in the red record-protect tab on the reverse side of the cassette. To enable recording again, restore the tab to its original position.

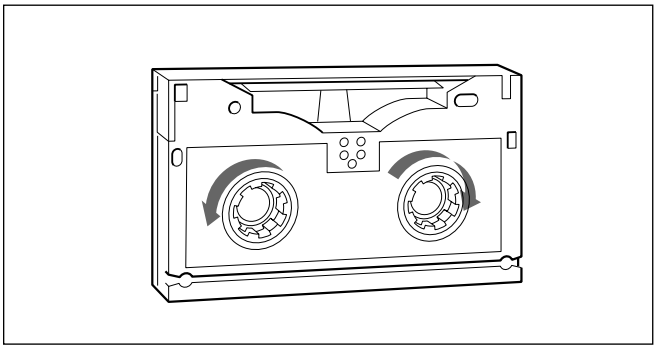


Preventing accidental erasure of recordings

3-2-3 Loading and Unloading a Cassette

Eliminating tape slack

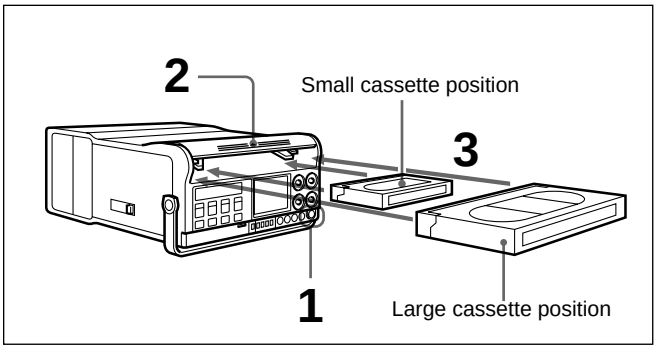
Before loading a cassette, insert you fingers into the reels and turn them gently in the direction shown by the arrows in the figure below. When the reels cannot turn any further, all slack will be eliminated.



Eliminating tape slack

Loading a cassette

It is not possible to load a cassette until the VTR is turned on.



Loading a cassette

1 Turn on the VTR.

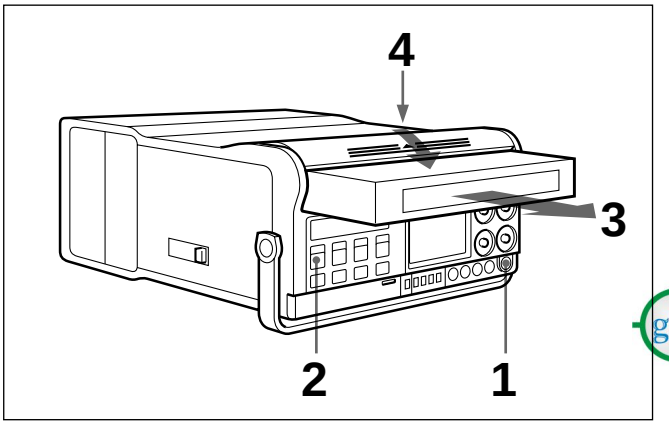
2 Pull up the cassette compartment cover.

3 Confirm that the HUMID indication is not on in the status indication panel. Then insert the cassette.

For information on what to do if the HUMID indication appears, refer to "Error/Warning Indicators on the Status Indication Panel, WARNING Indicator Conditions, and Warning Beeps" on page A-3.

When the cassette is fully inserted, the cassette compartment cover closes automatically.

Unloading the cassette



Unloading the cassette

1 Turn on the VTR.

2 Press the EJECT button.
The cassette comes out.

3 Remove the cassette.

4 Close the cassette compartment cover with your hand.

To eject the cassette when the VTR does not turn on

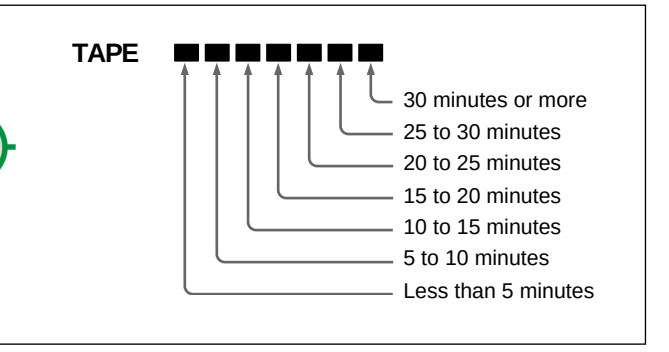
When power is cut off due to the exhaustion of the battery pack, for example, refer to the maintenance manual part 1 (supplied).

3-2-4 Checking the Remaining Time on the Tape

You can check the remaining recording time on the tape in the following two ways:

Using the status indication panel

When a tape is loaded, the TAPE indication lights up in the status indication panel and the seven segments flash.
When the tape transport starts, the segments continue to flash for several seconds. The number of segments that light up indicate the remaining time on the tape. All seven segments light up when 30 minutes or more remain. Each segment equals 5 minutes of remaining time on the tape.
The relationship between the number of segments and the remaining time is shown in the following figure:



Display segments and remaining time on the tape

When the remaining time reaches the 2-minute point, the leftmost segment and the TAPE indication start to flash, and the WARNING indicator flashes and a beep sounds intermittently. When the tape comes to the end, the WARNING indicator lights up and the beep sounds continuously.

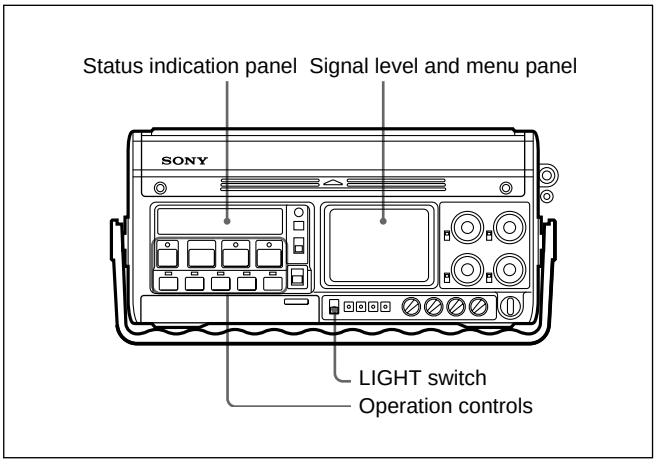
Using the DISPLAY button

Press the DISPLAY button (one of the display buttons) repeatedly to select the INFORMATION screen in the signal level and menu panel. Remaining time on the tape is displayed.

For details, see "4-1-3 Checking the VTR Status" on page 4-3.

3-3 Adjusting the Display and Indicator Brightness

You can adjust the brightness of the display panels and indicators on the operation controls as required for better visibility.



Adjusting the display and indicator brightness

In a dark environment

If the display and level meters are hard to see because of low-light conditions, set the LIGHT switch to ON to turn on the backlight.

In a bright environment

If the indicators on the operation controls are hard to see because the lighting is too bright, set the LIGHT switch to BRT to increase the brightness of the indicators.

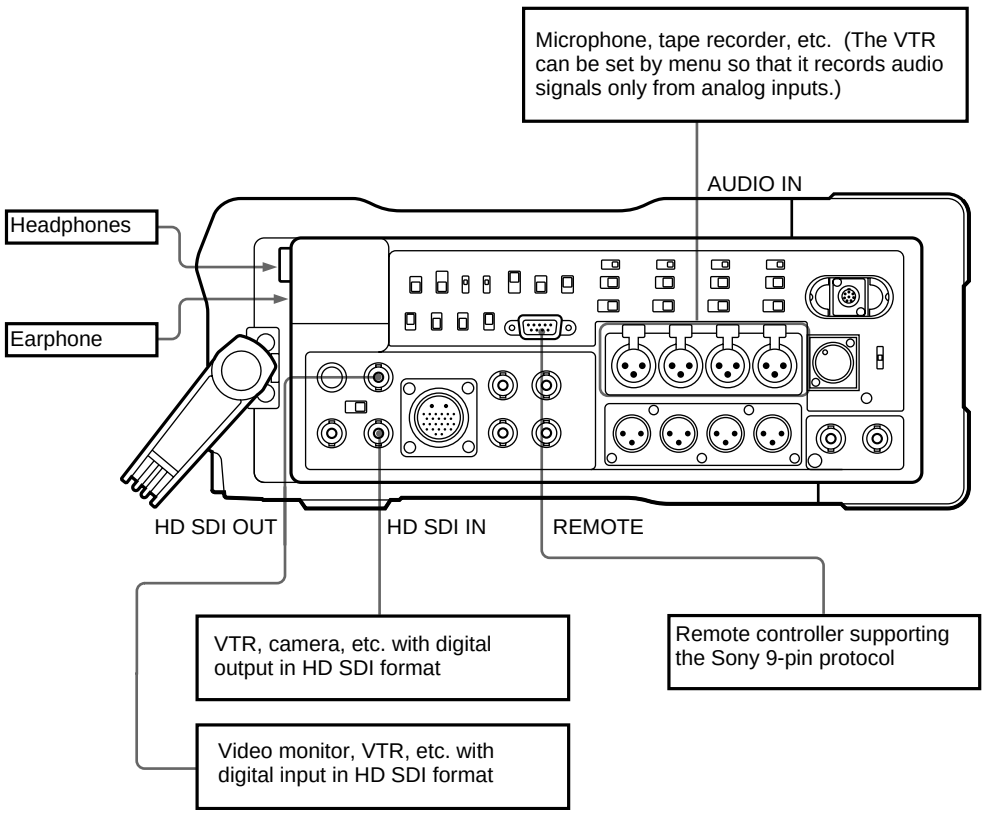
Unless lighting conditions require either of the settings above, set the LIGHT switch to OFF.

4-1 Preparations for Recording

This section describes the connections and adjustments that must be made before the start of actual recording.

4-1-1 Connecting Digital Equipment

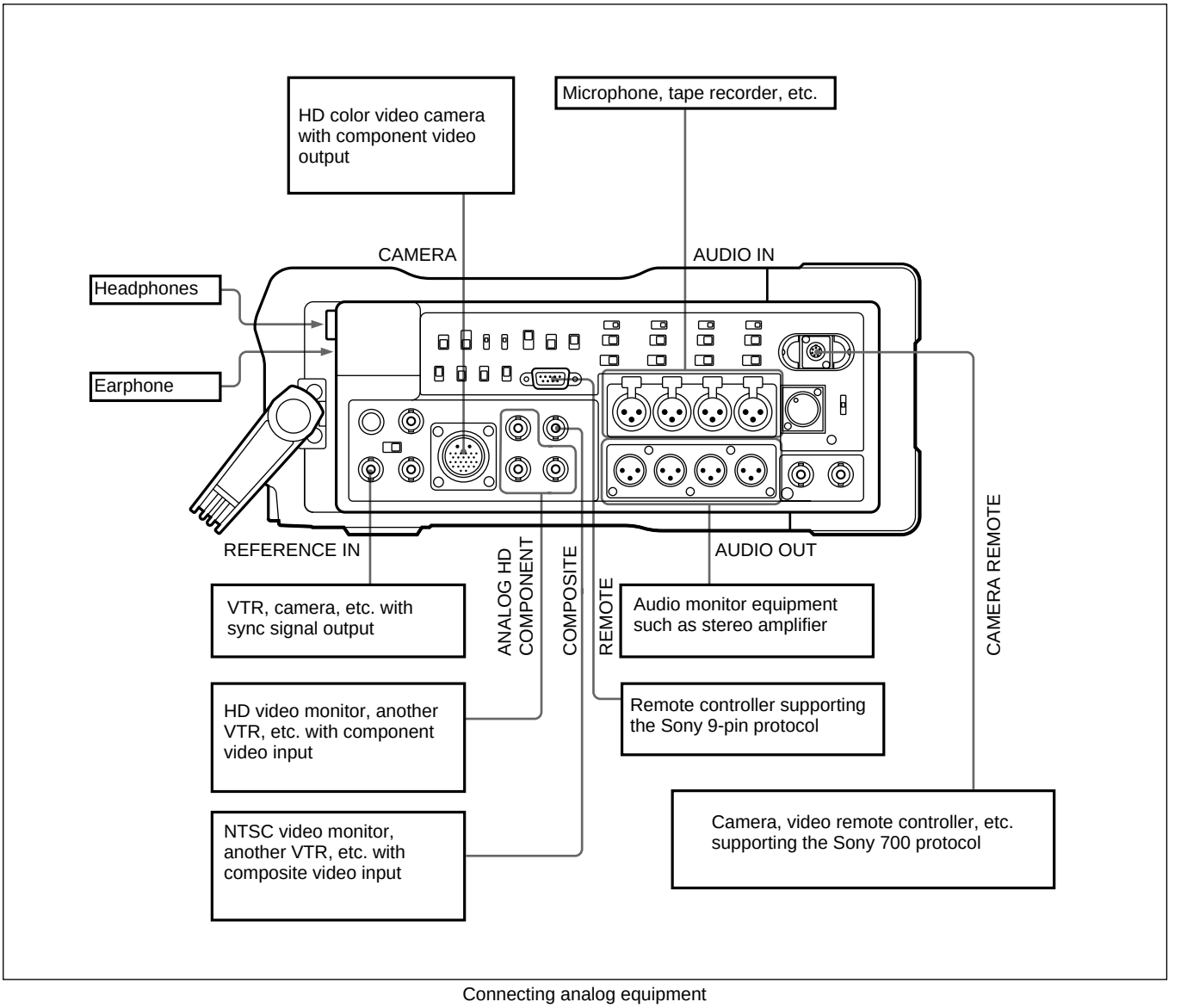
The following figure shows an example of the connections required when using this VTR with a camera, another VTR, video monitor, and other equipment with digital inputs and outputs in HD SDI (High-Definition Serial Digital Interface) format.


Microphone, tape recorder, etc. (The VTR can be set by menu so that it records audio signals only from analog inputs.)
AUDIO IN
Headphones
Earphone
HD SDI OUT
HD SDI IN
REMOTE
VTR, camera, etc. with digital output in HD SDI format
Remote controller supporting the Sony 9-pin protocol
Video monitor, VTR, etc. with digital input in HD SDI format

Connecting digital equipment

4-1-2 Connecting Analog Equipment

The following figure shows an example of the connections required when using the VTR with a camera, another VTR, video monitor, and other equipment with analog inputs and outputs.


HD color video camera with component video output
Microphone, tape recorder, etc.
CAMERA
AUDIO IN
Headphones
Earphone
REFERENCE IN
AUDIO OUT
VTR, camera, etc. with sync signal output
ANALOG HD COMPONENT
COMPOSITE
REMOTE
Audio monitor equipment such as stereo amplifier
CAMERA REMOTE
HD video monitor, another VTR, etc. with component video input
Remote controller supporting the Sony 9-pin protocol
NTSC video monitor, another VTR, etc. with composite video input
Camera, video remote controller, etc. supporting the Sony 700 protocol

Connecting analog equipment

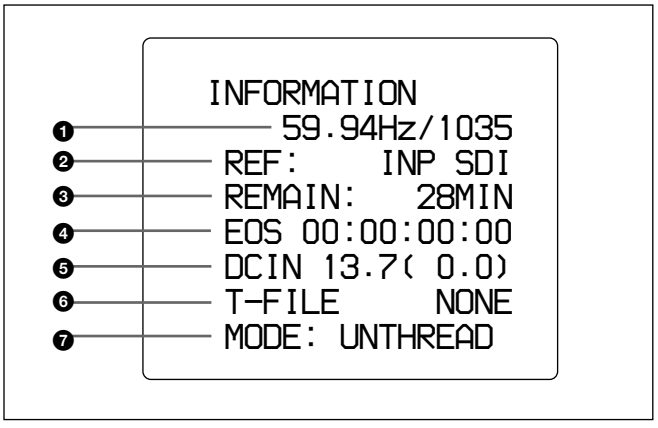
http://getMANUAL.com

4-1-3 Checking the VTR Status

Before the start of recording, check the recording conditions and VTR status, and change them if necessary.

Checking the VTR status

Press the DISPLAY button (one of the display buttons) repeatedly to display the INFORMATION screen in the signal level and menu panel. To display the INFORMATION screen using the DISPLAY button, set INFORMATI in the SYSTEM menu to ON (see page 7-13).



INFORMATION screen

❶ Field frequency/effective number of recording lines per frame
Settings on FREQUENCY and HD LINE in the SYSTEM menu (see page 7-14) appear.

❷ REF (servo reference signal selection)
The settings for SV/AV REF and EXT REF in the VTR CONTROL menu (see page 7-5) and position of the video input switch (see page 2-15) appear.

❸ REMAIN (remaining time on the tape)
Shows the remaining time on the tape in minutes. If a cassette is not inserted or if the VTR is calculating the remaining time, – – – – – – appears.

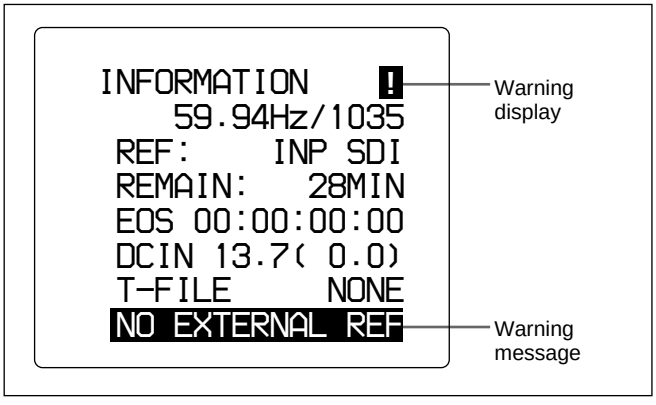
❹ EOS (end of source)/IN (IN point)
EOS: Displays the time code or CTL for the EOS position. When AUTO (automatic assemble) is selected as the recording mode, the next recording starts from this point.

IN: Displays the time code or CTL of the IN point created by pressing the ENTER button while holding down the FUNC button, or created by an external editing device. When recording in ASM (assemble) or AUTO (auto assemble) mode, the VTR displays the time code or CTL of the starting point of the current recording.
When no time data is available, – – : – – : – – : – – is displayed.

❺ Power source and voltage
Indicates the power source and its voltage.
DC IN XX.X (XX.X): An external power supply is being used. The value without parentheses to the right of the DC IN indication is the voltage of the external power supply, and the value within parentheses is the voltage of the battery pack.
BATT XX.X (XX.X): The battery pack is being used. The value without parentheses to the right of the BATT indication is the voltage of the battery pack, and the value within parentheses is the voltage of the external power supply.

❻ T-FILE (Tele-File information)
Displays the status of the memory label attached to the inserted cassette.
NONE: There is no MLB-1B-100 memory label (not supplied) attached to the cassette or there is no cassette.
READY: The memory label is in write-ready status.
WPROTECT The memory label is write-protected.

❼ MODE (operation mode)
Indicates the operation mode of the VTR. When a warning is issued, the warning display and a message appear as follows:

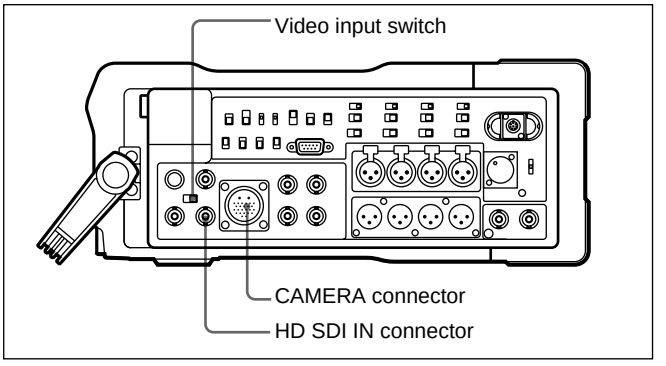


Use the ERROR LOG menu to display a list of the warning messages that have appeared in the past.
For information about the ERROR LOG menu, see "Error Log" on page A-5.

4-1-4 Making Video Input Settings

Selecting the video input signal

Select the video input signal as follows:



Selecting the video input signal

To select the signal input from the CAMERA connector

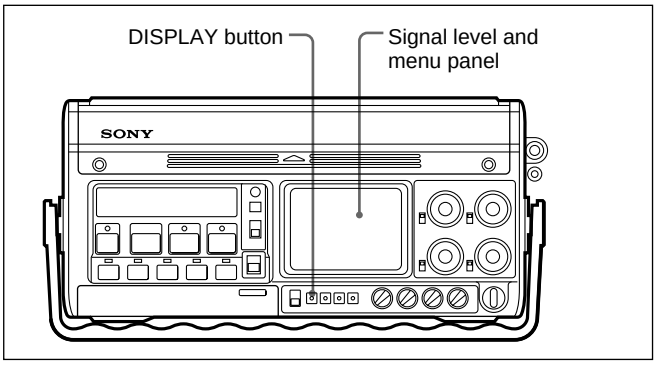
Set the video input switch to CAMERA.

To select the HD SDI video/audio signal input from the HD SDI IN connector

Set the video input switch to SDI IN. The SDI format includes audio signals, but you can select whether to use the audio signals as the audio input or to use other analog audio input. This setting can be done using INPUT 1/2 and INPUT 3/4 in the AUDIO menu (see page 7-12).

Displaying and adjusting the video input/output level

Check the video input and output levels using the video level meters.

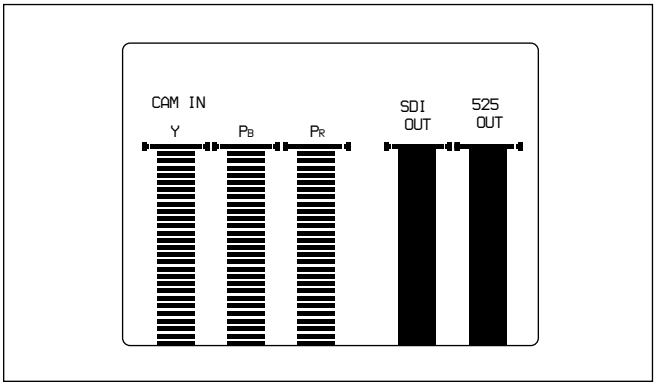


Displaying and adjusting the video input/output level

Press the DISPLAY button repeatedly to display video level meters.

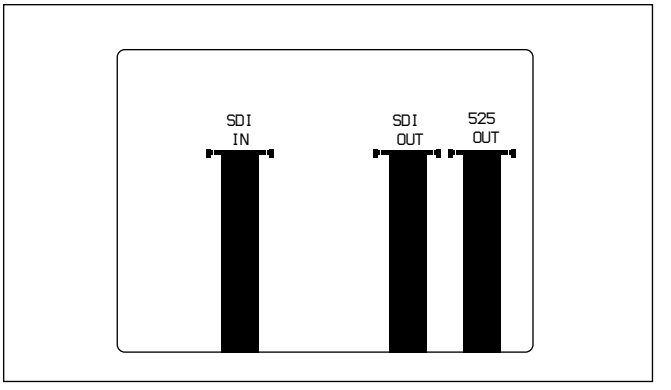
When the video input switch is set to CAMERA

From left to right, the Y, P_B, and P_R signal levels appear. The P_B and P_R signal meters reach their maximum levels when a 100% color bar signal is input. The presence or absence of signal output at the HD SDI OUT connector and COMPOSITE MONITOR OUT connector are then displayed in succession.



When the video input switch is set to SDI IN

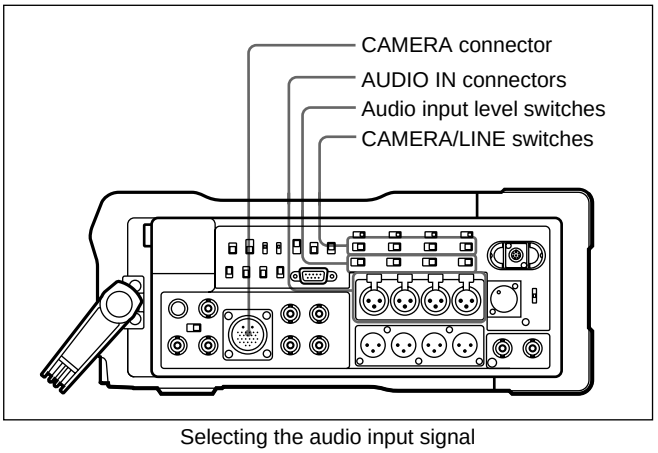
From left to right, the presence or absence of the following signals is displayed: input signal at the HD SDI IN connector, output signal at the HD SDI OUT connector, and output signal at the COMPOSITE MONITOR OUT connector.



4-1-5 Making Audio Input Settings

Selecting the audio input signal

Select the audio input signal as follows:



Selecting the audio input signal

When the video input is digital

When the selected video input signal is a digital signal in the SDI format, it is possible to specify whether to use the audio signal in the SDI signal as the audio input to the VTR or to use the analog signal input from the AUDIO IN connectors or CAMERA connector. This setting can be done using INPUT 1/2 and INPUT 3/4 in the AUDIO menu (see page 7-12).

When ANA is selected for INPUT 1/2 and INPUT 3/4 in the AUDIO menu, select the audio input signal as you would for an analog video input signal.

When the video input is analog

If the video input is analog, analog audio input is selected regardless of the INPUT 1/2 and INPUT 3/4 settings in the AUDIO menu. Use the CAMERA/LINE switches to select analog signals for the audio input.

CAMERA: The audio signal input from the CAMERA connector is selected instead of the audio signal input from the corresponding AUDIO IN connector. Set the corresponding audio input switch to –20.

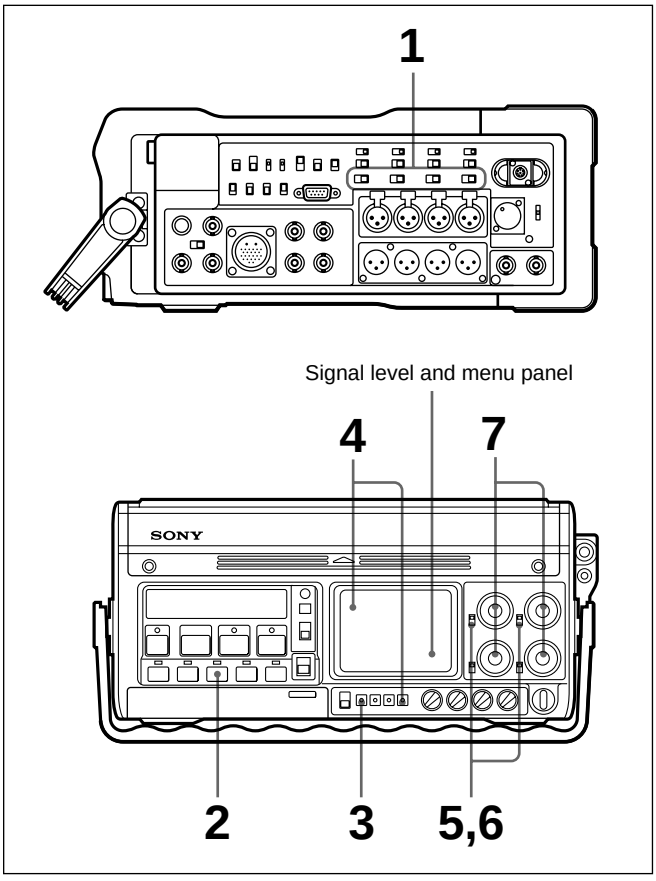
LINE: The audio signal input from an AUDIO IN connector is selected.

Recording the same audio signal on channels 3 and 4 and channels 1 and 2

Set DOUBL REC in the AUDIO menu to ON (see page 7-12).

Adjusting the recording level

It is possible to adjust the recording level for analog input.



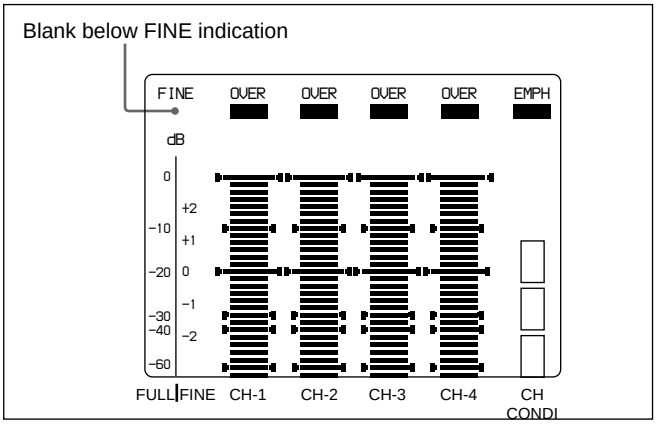
Adjusting the recording level

1 Set the audio input level switches so that they correspond with the input level.

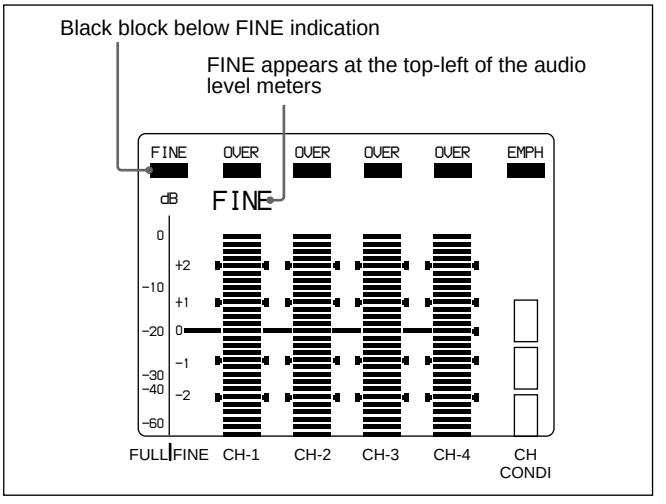
2 Press the FUNC button.
The VTR switches to E-E mode.

3 If the audio level meters do not appear in the signal level/menu panel, press the DISPLAY button repeatedly until the audio level meters appear.

4 Specify the level meter display mode.
There are two modes for displaying the audio level meters: FULL (display range: –60 to 0 dB) and FINE (display range: –20 to ±2 dB). Pressing the SET/FINE/SEARCH button changes the audio level meter display mode. When FULL mode is selected, nothing appears in the space below the FINE indication at the top-left corner; when FINE mode is selected, a black block appears below the FINE indication at the top-left corner and FINE appears at the top-left of the audio level meters. Select the FULL mode first to make a rough adjustment, then select the FINE mode for fine adjustment.



Display in the FULL mode



Display in the FINE mode

5 Set the UNI/VAR switch for the channel to be adjusted to UNI.
The input level for the channel appears.

6 Set the UNI/VAR switch to VAR.

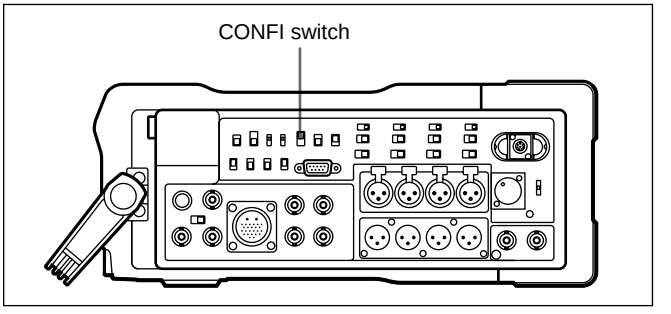
7 While monitoring the level meter, turn the recording level control for the audio channel to adjust the recording level.

Adding emphasis

To add emphasis to the recording of the signals input from the AUDIO IN connectors, set EMPHASIS in the AUDIO menu to ON (see page 7-12). When emphasis is added, a black block appears below the EMPH indication at the top-right of the audio level meters.

4-1-6 Selecting the Monitoring Mode for Recording

Set the monitoring mode for recording as follows:



Selecting the monitoring mode for recording

Use the CONFI switch to select the monitoring mode for recording.

ON: The signal being recorded is played back simultaneously for monitoring.

Note

When the recording of the input signal from the camera is synchronized with an external reference signal, the E-E signal is used for monitoring.

ECC: The input signal is monitored as is in E-E mode. If a serious error is detected while recording, an error message appears in the signal level and menu panel.

OFF: The input signal is monitored as is in E-E mode. The RF envelope is monitored during recording, and if an error occurs, an error message appears in the signal level and menu panel.

To reduce power consumption

The ON setting results in the highest power consumption, and the OFF setting the lowest. When using the VTR with a battery pack, set this switch to ECC or OFF.

4-1-7 Setting the Time Code Values

Selecting the time code to be recorded

Use the F-RUN/R-RUN switch and REC RUN and EXT TC IN in the TIME CODE menu (see page 7-7) to select the time code to be recorded. The settings and the time code recorded are shown in the table below.

F-RUN/R-RUN switch setting	REC RUN setting	EXT TC IN setting	Time code to be recorded
R-RUN	INT		The time code value specified by the internal time code generator is recorded. Any time code value can be specified for the time code generator. The time code running mode (drop frame mode or non-drop frame mode) can be specified by the DF/NDF switch.
	TAPE		The time code value recorded on the time code track on the tape is recorded. The time code running mode on the tape is applied to the time code to be recorded.
F-RUN		TC IN	The VTR locks to the time code data input from the TC IN connector and the input time code value is recorded. If no time code is input or input time code is not advancing, the time code automatically advances and is recorded. The time code running mode on the input time code is applied to the time code to be recorded. When the VTR does not lock to the input time code, the DF/NDF switch setting is applied.
		SDI	The VTR locks to the time code data input from the HD SDI IN connector and the input time code value is recorded. If no time code is input, the time code automatically advances and is recorded. The time code running mode on the input time code is applied to the time code to be recorded. When the VTR does not lock to the input time code, the DF/NDF switch setting is applied.

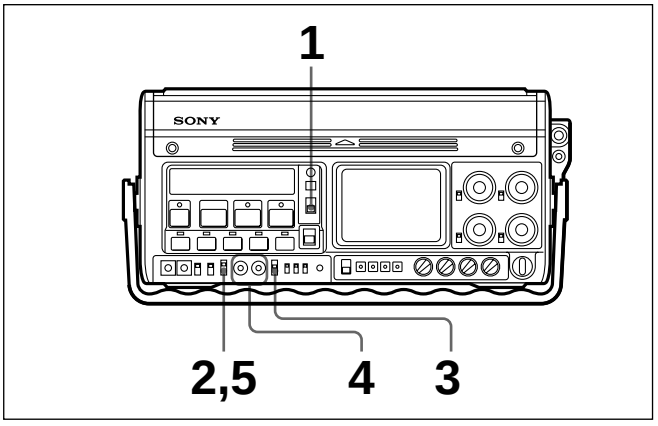
Selecting the user's bits to be recorded

Use the REAL TIME REC/SET switch, REAL TIME LTC/VITC switch, F-RUN/R-RUN switch, and EXT-LOCK/U-BIT switch and REC RUN and EXT TC IN in the TIME CODE menu (see page 7-7) to select the user's bits to be recorded. The settings and the user's bits recorded are shown in the table below.

REAL TIME REC/ SET switch setting	REAL TIME LTC/ VITC switch setting	F-RUN/ R-RUN switch setting	REC RUN setting	EXT TC IN setting	EXT-LOCK/U-BIT switch setting	User's bits to be recorded
REC ON	LTC U-BIT					The actual time is recorded as the user's bits value in the LTC. The value generated by the internal user's bits generator is recorded as the user's bits value in the VITC.
	VITC U-BIT					The value generated by the internal user's bits generator is recorded as user's bits value in the LTC. The actual time is recorded as the user's bits value in the VITC.
OFF		R-RUN	INT			The user's bits value generated by the internal user's bits generator is recorded. Any user's bits value can be specified for the user's bits generator.
			TAPE			The user's bits value recorded on the time code track on the tape is recorded.
		F-RUN		TC IN	ON	The VTR locks to the user's bits value input from the TC IN connector and the input user's bits value is recorded. When the VTR does not lock to the input user's bits value, the user's bits value generated by the internal user's bits generator is recorded.
					OFF	The user's bits value generated by the internal user's bits generator is recorded.
				SDI	ON	The VTR locks to the user's bits value input from the HD SDI IN connector and the input user's bits value is recorded. When the VTR does not lock to the input user's bits value, the user's bits value generated by the internal user's bits generator is recorded.
					OFF	The user's bits value generated by the internal user's bits generator is recorded.

Setting a constant user's bits value

The user's bits value recorded on the time code track provides eight hexadecimal digits which can be used for recording the date, time, scene number, and other information.



Setting a constant user's bits value

1 Set the DISPLAY switch to U-BIT.

2 Set the F-RUN/R-RUN switch to SET.

3 Set the REAL TIME REC/SET switch to REC ON or OFF.

4 Use the SHIFT/DEL button and ADVANCE/INS button to set the user's bits value.

SHIFT/DEL button: Press repeatedly to cycle through the digits, causing the digit be changed to flash.

ADVANCE/INS button: Each press of this button increases the value of the flashing digit by one.

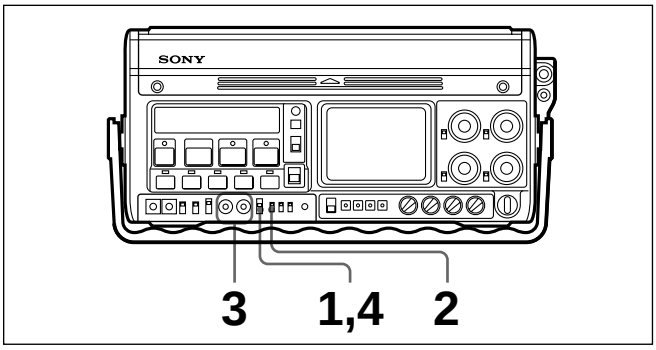
Hexadecimal digits A to F appear in the seven-segment display as follows:

Digit	A	B	C	D	E	F
Display	A	b	C	d	E	F

5 Set the F-RUN/R-RUN switch to F-RUN or R-RUN.

Setting the actual time as the user's bits value

With this setting, actual time can be recorded on the tape.



Setting the actual time as the user's bits value

1 Set the REAL TIME REC/SET switch to SET.

2 Use the REAL TIME LTC/VITC switch to select the time code in which the actual time is to be inserted as the user's bits value.

LTC U-BIT: The actual time is inserted in the LTC.

VITC U-BIT: The actual time is inserted in the VITC.

3 Use the SHIFT/DEL button and ADVANCE/INS button to set the actual time.

SHIFT/DEL button: Press repeatedly to cycle through the digits, causing the digit to be changed to flash.

ADVANCE/INS button: Each press of this button increases the value of the flashing digit by one.

4 Set the REAL TIME REC/SET switch to REC ON or OFF.

REC ON: During recording, the actual time is recorded as the user's bits value.

OFF: The actual time is not recorded as the user's bits value, but the internal clock continues keeping the actual time.

To check the actual time

1 Set the DISPLAY switch (beside the status indication panel) to U-BIT.

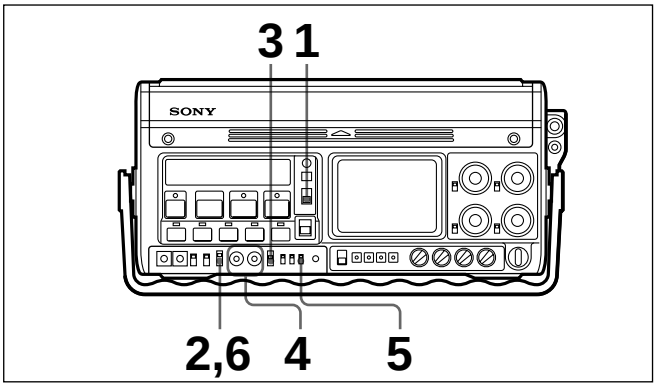
2 Set the REAL TIME REC/SET switch to REC ON.

3 Set the DISPLAY switch (one of the time code setting controls) to LTC or VITC.
Whether the actual time is inserted into the LTC or VITC depends on the setting made in step **2** in "Setting the actual time as the user's bits value" on page 4-9.

4 Press the FUNC button.

Setting the time code value

Do the following procedure to specify the time code value.



Setting the time code value

1 Set the DISPLAY switch (beside the status indication panel) to TC.

2 Set the F-RUN/R-RUN switch to [SET].

3 Set the REAL TIME REC/[SET] switch to REC ON or OFF.

4 Use the [SHIFT]/DEL button and [ADVANCE]/INS button to set the time code. Any value between 00:00:00:00 and 23:59:59:29 can be set.
[SHIFT]/DEL button Press repeatedly to cycle through the digits, causing the digit to be changed to flash.
[ADVANCE]/INS button Each press of this button increases the value of the flashing digit by one.

5 Set the DF/NDF switch to DF or NDF.
DF: The time code advances in drop frame mode[1].
NDF: The time code advances in non-drop frame mode[1].

6 Set the F-RUN/R-RUN switch to F-RUN or R-RUN.
F-RUN: The time code advances continuously, regardless of the operating status of the VTR. When you select this position, the time code starts advancing immediately.
R-RUN: The time code advances only during recording. When you select this position, the time code starts advancing only when recording starts and the REC RUN setting in the TIME CODE menu (see page 7-7) determines whether the time code recorded is that produced by the time code generator or that generated by the playing of the tape.

Time codes and battery pack replacement

This VTR is equipped with an internal battery for use as a backup power supply for the time code generator. The time code generator can thus continue running even when you change the battery pack. The backup battery lasts for about five years.

4-1-8 Locking the Time Code Generator to an External Signal

It is possible to lock the VTR's time code generator to an external time code generator, or an external time code generator to the VTR's time code generator.

1) **Drop frame mode**
The frame rate in the NTSC color system is 29.97 frames per second, while time code is based on a rate of 30 frames per second. The discrepancy that results between the two rates is corrected by a drop frame method by which frame numbers are skipped at appropriate intervals, thereby maintaining values that are consistent with the actual elapsed time.

2) **Non-drop frame mode**
As its name implies, frames are not skipped in this mode, and the discrepancy between the 30-frame-per-second time code and the actual elapsed time is not corrected.

Locking the VTR to an external time code generator

1 Select the external time code source to which the VTR will be locked by setting EXT TC IN in the TIME CODE menu (see page 7-7).

TC IN: The VTR locks to the time code input from the TC IN connector.

SDI: The VTR locks to the VITC included in the signal input from the HD SDI IN connector.

2 **When TC IN is selected**

Connect the time code output from the external device to the TC IN connector of the VTR.

See the connections for the first HDW-250 shown in the figure "Connection example for time-code-locking of multiple HDW-250 units" on page 4-12.

When SDI is selected

Connect the output of the HD SDI signal including VITC data from the external device to the HD SDI IN connector of the VTR.

3 Set the F-RUN/R-RUN switch on the VTR to F-RUN.

The internal time code generator of the VTR locks to the external time code generator. Once the time code generator has been locked, this status continues, even if input from the TC IN connector has been cut. In this case, the accuracy of time code is determined by the accuracy of the generator of the sync signal for the video input signal.

If the external time code input from the HD SDI IN connector is cut, the accuracy is that of the VTR's internal time code generator.

About the external locking of the time code generator

Once the VTR is locked to an external time code, color frame locking is disabled. To do color frame locking, first set the F-RUN/R-RUN switch to R-RUN, and then to F-RUN.

For an explanation of the color frame lock, see the footnote on page 2-5.

Locking the user's bits value to an external signal

First lock the VTR to an external time code source, and then set the EXT-LOCK/U-BIT switch to ON to lock the user's bits value of the VTR to the user's bits value included in the external time code.

When the EXT-LOCK/U-BIT switch is set to OFF, the user's bits value is not affected by the external signal.

Selecting the signal output to the TC OUT connector

Select the signal to be output to the TC OUT connector by setting TC OUT in the TIME CODE menu (see page 7-7).

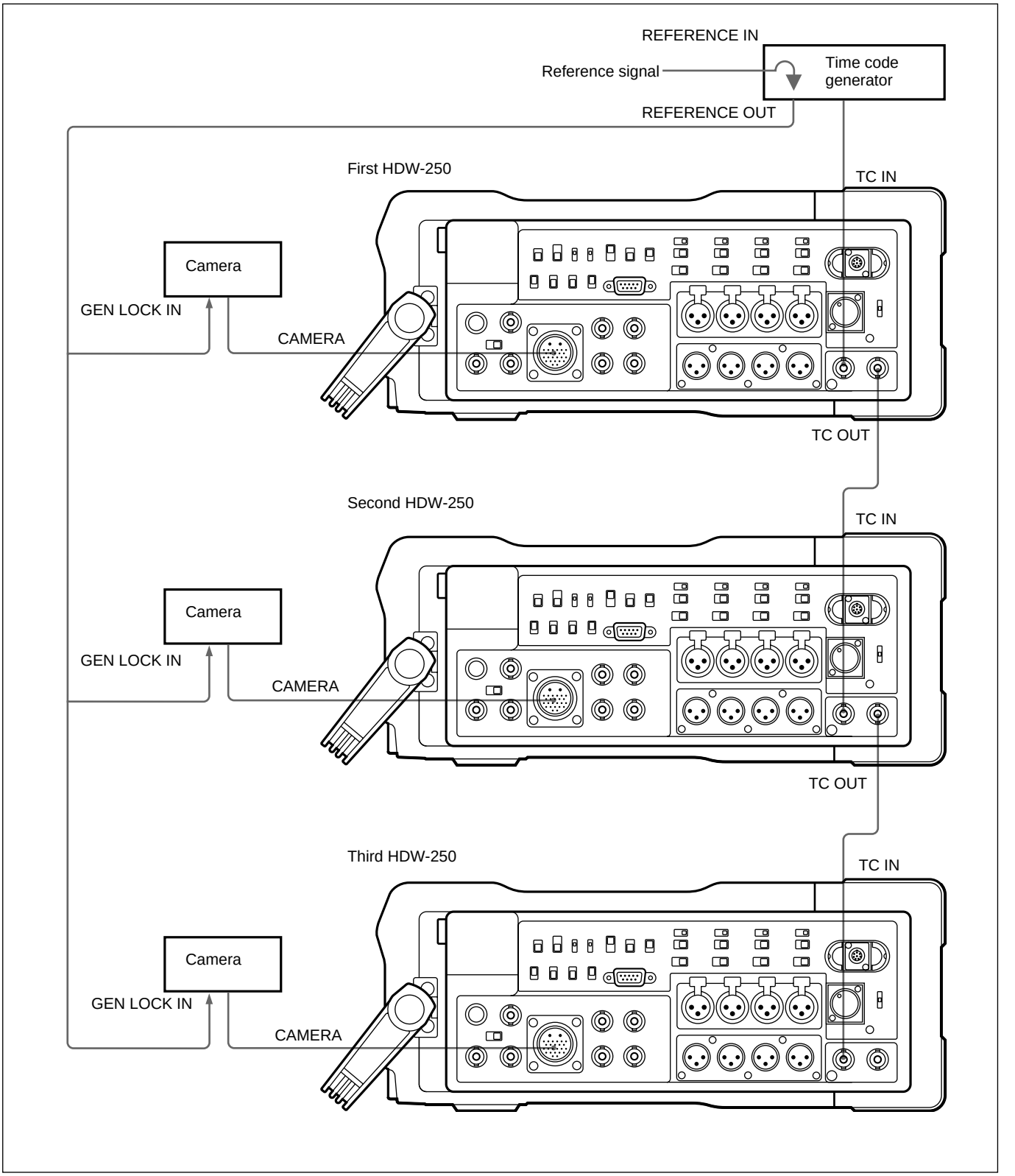
GEN: The signal generated by the internal time code generator is output.

AUTO: During recording or in E-E mode, the signal generated by the internal time code generator is output. During playback, the LTC recorded on the tape is output.

Time code locking of multiple HDW-250 units using the TC IN and TC OUT connectors

Connect the HDW-250 units as shown in the figure on page 4-12.

In this case, set the F-RUN/R-RUN switch on each VTR to F-RUN. Then, on the first HDW-250, set TC OUT in the TIME CODE menu to GEN (see page 7-7) in order to output the time code generator signal from the TC OUT connector.



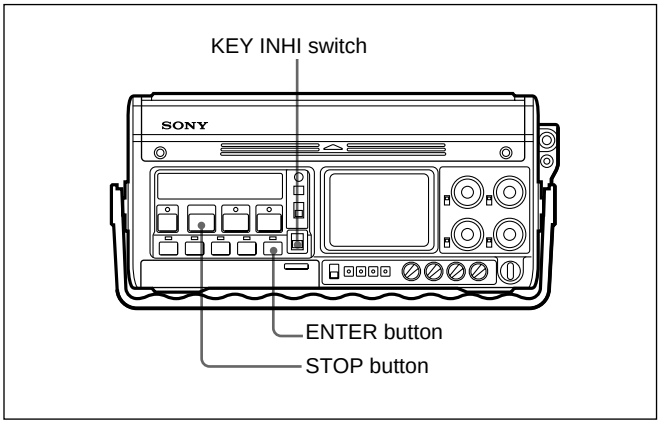
Connection example for time-code-locking of multiple HDW-250 units

http://getMANUAL.com

4-2 Procedures for Recording

This section describes how to protect a recording session from inadvertent operations on the VTR, as well as actual recording procedures.

4-2-1 Preventing Inadvertent Operations During Recording



Preventing inadvertent operations during recording

Normally, inadvertent operation are prevented from affecting the VTR during a recording session by disabling all controls except the STOP and ENTER buttons.
To disable STOP and ENTER buttons as well, set the KEY INHI switch to ON after the start of recording. At the end of recording, set the KEY INHI switch back to OFF, and then press the STOP button.

4-2-2 Selecting the Recording Mode

This VTR has the three recording modes described below. Select the recording mode with REC MODE in the EDIT menu (see page 7-6).

CRUSH: The VTR records in crush mode. When recording ends, the VTR stops at the EOS and the next recording starts from that point. The continuity of the video signal is not maintained. When you press the PREROLL button while in crush recording mode, the VTR pre-rolls to the EOS of the last recording, or to the IN point.

ASM: The VTR records in assemble mode. When recording ends, the VTR cues to a point about three seconds before the EOS and stops there until the start of the next recording. Continuity of the video signal is thus maintained. When you start the next recording from any point on the tape other than the EOS, the VTR advances the tape for about three seconds, then starts recording. When you press the PREROLL button while in assemble recording mode, the VTR pre-rolls to a point about three seconds before the EOS of last recording or to the IN point. To perform tag recording to the EOS of last recording or the IN point after transporting the tape after recording, be sure to press the PREROLL button.

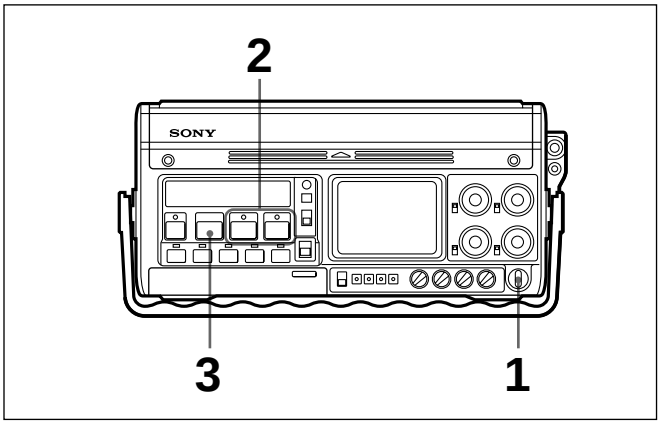
AUTO: The VTR records in automatic assemble mode. When recording finishes, the VTR cues up to the point about three seconds before the EOS and stops for the next recording. Therefore, the continuity of the video signal is maintained. Even when you start next recording from any point on the tape other than EOS and IN point, the VTR pre-rolls to a point three seconds before the EOS or IN point, and starts recording. When you press the PREROLL button while in automatic assemble recording mode, the VTR cues to a point about three seconds before the EOS of last recording or the IN point.

Notes

- To maintain continuity in the video signal in assemble recording mode or automatic assemble recording mode, there must be three or more seconds of continuously recorded data prior to the point where the next recording starts.
- The VITC cannot be used as time data in assemble recording mode or automatic assemble recording mode.

4-2-3 Recording Video and Audio Signals

Do the procedure below to record video and audio signals.



Recording video and audio signals

1 Turn the POWER switch on and load a cassette. Be sure to select the recording mode with REC MODE in the EDIT menu (see page 7-6).

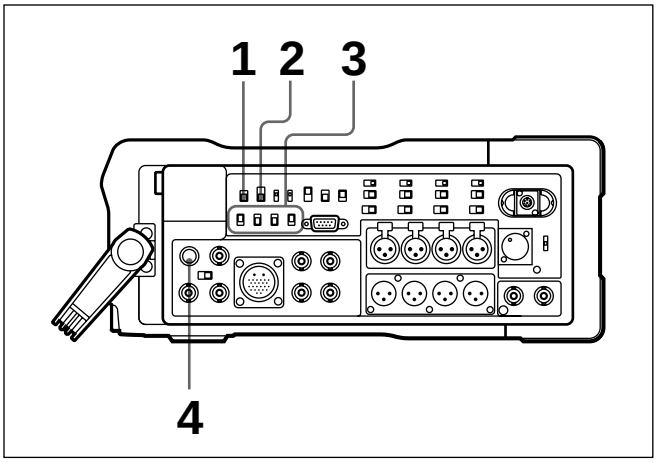
2 Press the PLAY ► button while holding down the REC ● button.
Recording starts.

3 To stop recording, press the STOP ■ button.
The VTR enters standby mode. If the VTR stays in standby mode longer than the duration specified by STILL TMR in the VTR CONTROL menu (see page 7-5), the VTR automatically stops the head drum rotation to protect the tape.

5-1 Preparations for Playback

5-1-1 Selecting the Audio Signal to Be Monitored

Use the MONITOR SELECT switches to select the audio signal to be output to the EARPHONE connector and HEADPHONES connector during playback. When the CH-3/4 OUT switch is set to MON, these switches can also be used to select the audio output for channels 3 and 4 of the AUDIO OUT connectors.



Selecting the audio signal to be monitored

1 Set the MONITOR SELECT CUE/DA switch to the desired position.

CUE: The audio on the cue track of the tape is monitored.

DA: The audio channels on the tape selected by the MONITOR SELECT 1/2/ 3/4 MIX switch are monitored.

2 If DA is selected in step **1**, specify the channels to be monitored with the MONITOR SELECT 1/2 3/4 MIX switch.

1/2: Audio channels 1 and 2 are monitored.

3/4: Audio channels 3 and 4 are monitored.

MIX: The signals selected by the switches (set to ON) below the MONITOR SELECT 1/2 3/4 MIX switch are monitored as a mixed signal.

3 If MIX is selected in step **2**, set the switches below the MONITOR SELECT 1/2 3/4 MIX switch to select the channels to be monitored.

4 Adjust the audio level output of the EARPHONE connector and HEADPHONES connector with the PHONE LEVEL control.

Selecting the signals output to the AUDIO OUT 3 and 4 connectors

Set the CH-3/4 OUT switch as follows:

MON: The signals selected by the MONITOR SELECT switches are output.

LINE: The signals of audio channels 3 and 4 are output.

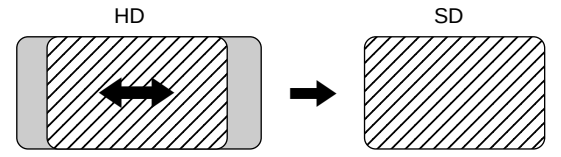
5-1-2 Playing Back in Sync With an External Reference Signal

Connect source of the reference video signal to the REFERENCE IN connector and set EXT REF in the VTR CONTROL menu (see page 7-5) to the position that corresponds to the reference signal to enable the VTR to play back in sync with the reference signal.

5-1-3 Selecting the Down Conversion Mode

The down conversion mode can be selected using DOWNCONVERTER MODE and LETTER BOX MODE in the VIDEO(NTSC) menu (see page 7-11).

• Edge crop (CROP)

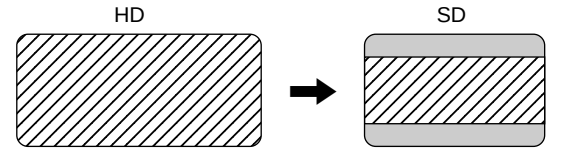


One-fourth of the HD screen on each side is cut off.

Horizontal adjustment of the edge cropping
Adjust the H CROP POSITION in VIDEO(NTSC) menu (see page 7-11).

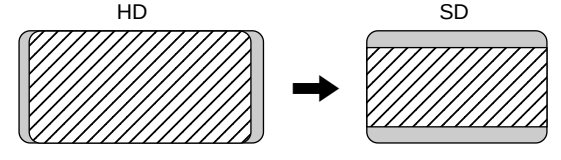
• Letter box mode (LETTER BOX)
When the letter box mode is selected, you can select one of the following conversion methods through the LETTER BOX MODE in VIDEO(NTSC) menu (see page 7-11).

When 16:9 is selected



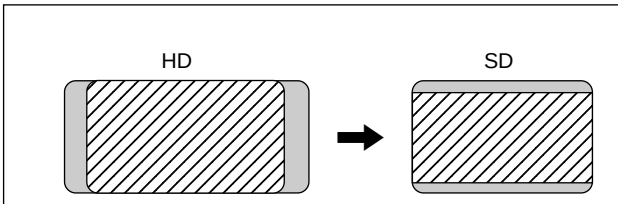
The signal is compressed, maintaining an aspect ratio of 16:9.

When 14:9 is selected



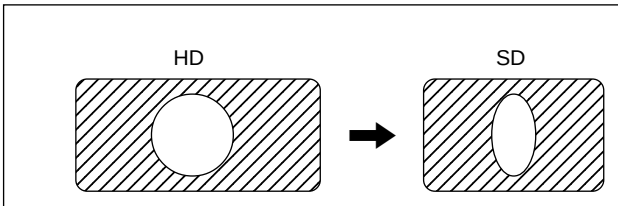
The sides of the HDVS image are cut and the signal is compressed, changing the aspect ratio to 14:9.

When 13:9 is selected



The sides of the HDVS image are cut and the signal is compressed, changing the aspect ratio to 13:9.

• Squeeze mode (SQUEEZE)

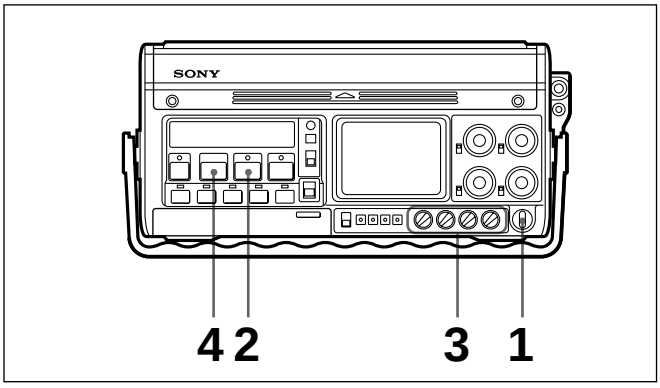


The sides of the HDVS image are cut and the signal is compressed, changing the aspect ratio to 13:9.

5-2 Procedures for Playback

This section describes how to play back tapes at normal speed and how to perform high-speed searching.

5-2-1 Normal-speed Playback



Normal-speed playback

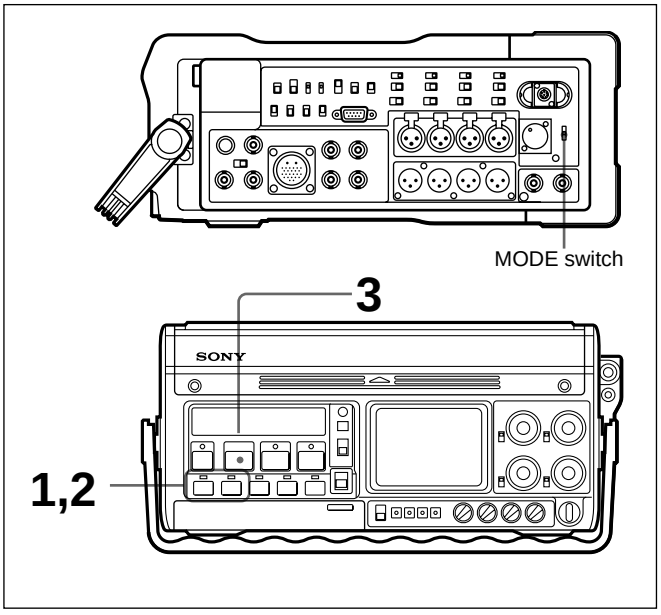
1 Turn the POWER switch on and load a cassette.

2 Press the PLAY ► button.
Playback starts.

3 Adjust the output level of audio channels by turning their respective AUDIO PB LEVEL controls.
The controls affect the output level of both the HD SDI OUT connector and AUDIO OUT connectors.

4 To stop playback, press the STOP ■ button.

5-2-2 High-speed Searching



High-speed searching

1 Press the F FWD ►► button to search in the forward direction; press the REW ◄◄ button to search in the reverse direction.
The VTR starts high-speed searching. If the MODE switch is set to PB, color playback occurs at a maximum speed of approximately 24 times normal speed. If the switch is set to PB/EE, an E-E signal is output to the monitor. If the switch is set to SAVE, no video signal is output during high-speed searching.

2 To apply the speed specified by SEARCH in the VTR CONTROL menu (see page 7-5), hold down the F FWD ►► button or REW ◄◄ button.
While the button is held down, the VTR plays back in color at the speed specified by SEARCH in the VTR CONTROL menu (approximately 2, 5, or 8 times normal speed).

3 To stop high-speed searching, press the STOP ■ button.

Changing the speed during a search

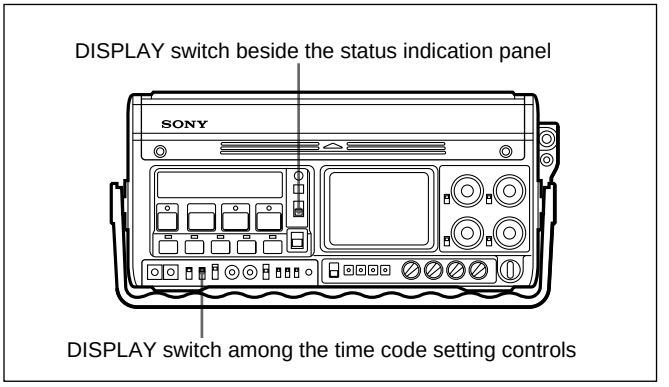
Press the F FWD ►► button or REW ◄◄ button while holding down the FUNC button. The search speed changes each time you press the F FWD ►► button or REW ◄◄ button (in the following cyclic sequence: 2×, 5×, 8×), regardless of the SEARCH setting in the VTR CONTROL menu.

5-3 Reading and Displaying the Time Code and User's Bits

During playback, the internal time code reader reads the time code and user's bits recorded on the tape. This information can be displayed in the status indicator panel or on a monitor connected to the VTR.

Displaying time code or user's bits value in the status indication panel

For details on the display of time data, see the table "Switch settings and the time data display" on page 2-6.

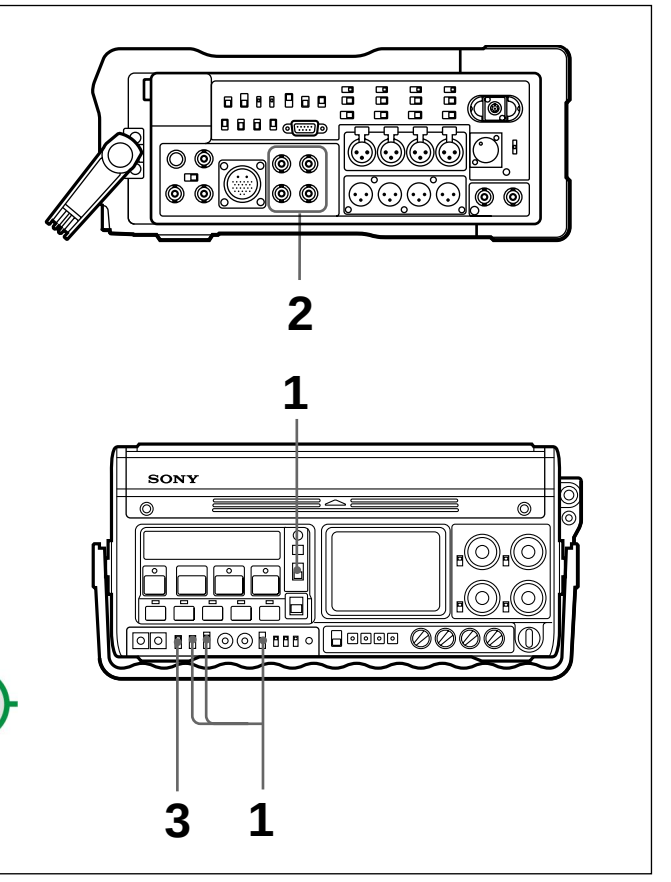


Displaying time code or user's bits value in the status indication panel

To select the value to be displayed, set the DISPLAY switches located by the status indication panel and among the time code setting controls, as shown in the table below:

Values displayed		Position of the DISPLAY switch by the status indication panel	Position of the DISPLAY switch among the time code setting controls
Time code	LTC	TC	LTC
	VITC		VITC
User's bits	LTC	U-BIT	LTC
	VITC		VITC

Displaying the time code or user's bits on the monitor display



Displaying the time code or user's bits on the monitor display

1 Display the time code or user's bits in the status indication panel.

For details on displaying time data, see the table "Switch settings and the time data displayed" on page 2-6.

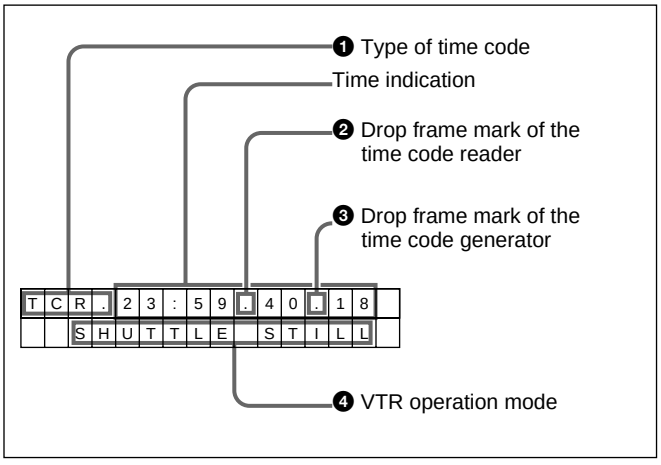
2 Connect the input connector of the monitor to the ANALOG HD COMPONENT MONITOR OUT connector or COMPOSITE MONITOR OUT connector on the VTR.

3 Set the SUPERIMPOSE switch to ON.

Selecting the display contents

The contents of the display can be selected with DISP INFO in the CHAR OUT menu (see page 7-8).

STAT: time code information and VTR operation mode
UB: time code information and user's bits
CTL: time code information and CTL
VITC: time code information and VITC
TIME: time code information only


❶ Type of time code
Time indication
❷ Drop frame mark of the time code reader
❸ Drop frame mark of the time code generator
TCR. 23:59.40.18
SHUTTLE STILL
❹ VTR operation mode

Example of display when STAT is selected

❶ Type of time code

Indication	Meaning
CTL	CTL counter data
TCR	LTC reader time code
UBR	LTC reader user's bits
TCR.	VITC reader time code
UBR.	VITC reader user's bits
TCG	LTC generator time code
UBG	LTC generator user's bits
TCG.	VITC generator time code
UBG.	VITC generator user's bits

When the time code or user's bits are not read correctly

An asterisk (*) is displayed in the time code block as follows: "T*R," "U*R," etc.

❷ Drop frame mark of the time code reader

.: Drop frame mode
:: Non-drop frame mode

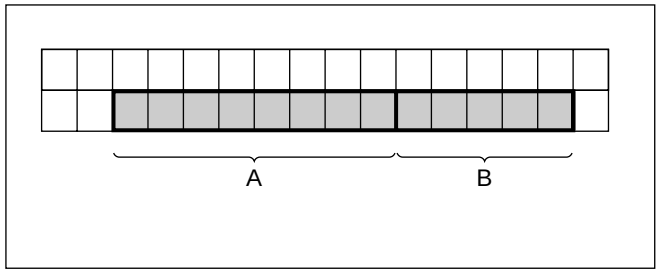
❸ Drop frame mark of the time code generator

.: Drop frame mode
:: Non-drop frame mode

❹ VTR operation mode

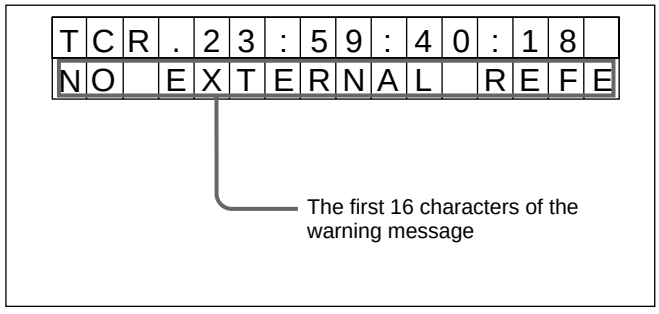
The information displayed is divided into blocks A and B as shown below:

A block: Operation mode
B block: Tape speed or servo lock status



For the display of warning messages

Set DISP INFO in the CHAR OUT menu to any setting other than TIME, and set CHAR WANG in the CHAR OUT menu to ON (see page 7-8). The first 16 characters of the warning message will flash on the second line.



For details on the warning messages, see "Warning Messages" on page A-2.

When there are multiple warning messages, each message flashes twice before it is replaced by the next message. When there is no warning message, the item specified by using DISP INFO in the CHAR OUT menu (see page 7-8) flashes on the second line instead.

To set each warning message so that it does not appear in the monitor display

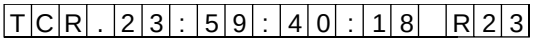
For details on the setting, see "Non-display and saving of error/warning messages in the error log" on page A-5.

To check remaining time on the tape

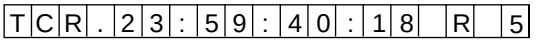
Use REMAIN TM in the CHAR OUT menu (see page 7-8).

OFF: Remaining time is not displayed.
ON: Remaining time is always displayed.
10M: Remaining time is displayed when it is 10 minutes or less.

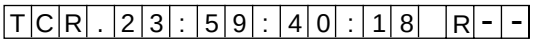
When remaining time on the tape is 23 minutes



When remaining time on the tape is 5 minutes



When remaining time on the tape is 100 minutes or more



Examples of remaining time display

Shifting the superimpose position

The superimpose position of the display contents can be shifted vertically in 24 levels.
Use CHAR V in the CHAR OUT menu (see page 7-8) to shift the position.

Outputting the playback time code from the TC OUT connector

Use TC OUT in the TIME CODE menu (see page 7-7) to output time code from the TC OUT connector during playback.

6-1 TELE FILE Menu

Using the TELE FILE menu, you can recall and update cue point information or cassette management information recorded on an MLB-1B-100 memory label (not supplied) attached to the inserted cassette.

All TELE FILE menu operations can be done through the HDW-250 control panel or on an external personal computer. Set REMOTE in the SYSTEM menu (see page 7-14) to select the HDW-250 or personal computer.

Before using an external personal computer Do the following:

- Install the MLZ-100 Memory Label Application Software (not supplied).
- Set REMOTE in the SYSTEM menu to TELEF (see page 7-14).

For details on operations using an external personal computer, refer to the User's Guide supplied with the MLZ-100.

HDW-250 control panel operations are used in the explanations below.

6-1-1 Displaying the TELE FILE Menu

To display the TELE FILE menu

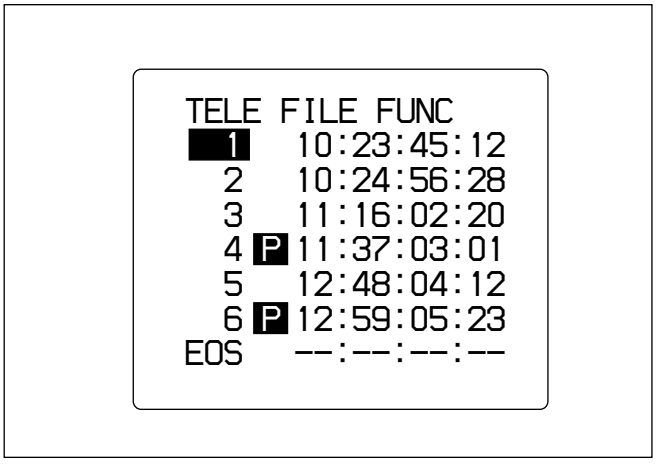
Do the procedure below.

1. Press the DISPLAY button in the adjustment controls repeatedly until the setup menu appears in the display.
2. Press the UP or DOWN/FREEZE button repeatedly to move the cursor (*) to "TELE FILE" (under "DISP SEL") (see page 7-13).
3. Press the SET/FINE/SEARCH button.
4. Press the UP or DOWN/FREEZE button to select "ON."
5. Press the SET/FINE/SEARCH button.
6. Press the DISPLAY button repeatedly until the list of cue point data in the TELE FILE menu appears in the display.

The letter **P** appears to the right of cue point number for cue points that have been write-protected on an external personal computer.

Note

Cue point data cannot be write-protected using the HDW-250.



To display the TELE FILE menu automatically

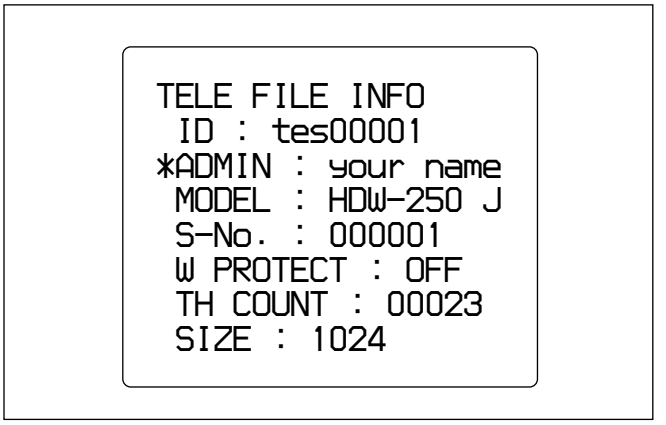
Set "T/F P-UP" in the TELE FILE menu to "ON" (see page 7-12). Whenever a cassette with a memory label is inserted in the HDW-250, the TELE FILE menu appears in the display (except when the setup menu is displayed).

To exit the TELE FILE menu

Press the DISPLAY button in the adjustment controls. The audio level meters appear in the display.

To display non-cue point data

Press the ADVANCE /INS button in the time code setting controls while holding down the SHIFT /DEL button. The non-cue point data recorded on the memory label is displayed.



To scroll up or down

Press the UP or DOWN/FREEZE button repeatedly to move the cursor (*) up or down.

To fully display a partially displayed item

Press the UP or DOWN/FREEZE button repeatedly to move the cursor (*) to the item. Then press the SET/FINE/SEARCH button. The entire contents of the selected item appear.

To modify the contents of a memory label

Information other than that related to cue points on a memory label cannot be modified using the HDW-250. This information must be modified using an external personal computer installed with the optional MLZ-100 Memory Label Application Software or using an optional MLU-100 Memory Label Reader/Writer connected to the external personal computer.
For details, refer to the User's Guide supplied with the MLZ-100 Memory Label Application Software or the operation manual supplied with the MLU-100 Memory Label Reader Writer.

To go back to the list of cue point data

Press the SET/FINE/SEARCH button in the adjustment controls.

6-1-2 Locating a Cue Point

Do the procedure below to locate a cue point that has been recorded on a memory label.

1 Do the steps 1 to 6 in "To display the TELE FILE menu" on page 6-1.

2 Press the UP or DOWN/FREEZE button repeatedly until the number of the cue point to be located is highlighted.

3 Press the SET/FINE/SEARCH button in the adjustment controls.

6-1-3 Adding or Deleting a Cue Point

Before you add or delete a cue point on the memory label, make sure that "W PROTECT" in the TELE FILE menu is set to "OFF" (see page 7-12).

To add a cue point to the end of the cue point list

Press the ENTER button while in the TELE FILE menu. The time code for the point at which the ENTER button is pressed is added to the end of the cue point list.

To insert a cue point in the middle of the cue point list

Do the procedure below.

1 Do the steps 1 to 6 in "To display the TELE FILE menu" on page 6-1.

2 Press the UP or DOWN/FREEZE button repeatedly to highlight the number of the cue point directly below the line where the new cue point is to added.

3 Press the ENTER button while holding down the ADVANCE /INS button in the time code setting controls.

The time code for the point at which the ENTER button is pressed is added to the line right above the highlighted cue point number.

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To delete a cue point from the list

Notes

- Cue points that have been write-protected on an external personal computer cannot be deleted using the HDW-250.
- Deleted cue points cannot be restored.

Do the procedure below to delete a cue point

1 Do the steps 1 to 6 in "To display the TELE FILE menu" on page 6-1.

2 Press the UP or DOWN/FREEZE button repeatedly until the number of the cue point to be deleted is highlighted.

3 Press the ENTER button while holding down the SHIFT /DEL button in the time code setting controls.

The cue point is deleted and all the following cue points move up one line.

6-1-4 Initializing a Memory Label

Before you initialize a memory label, make sure that "W PROTECT" in the TELE FILE menu is set to "OFF" (see page 7-12).
Do the procedure below to initialize a memory label using the HDW-250.

1 Press the DISPLAY button in the adjustment controls repeatedly until the setup menu appears in the display.

2 Press the UP or DOWN/FREEZE button repeatedly to move the cursor (*) to "T/F FORMAT" (see page 7-12).

3 Press the SET/FINE/SEARCH button.

4 Press the UP or DOWN/FREEZE button repeatedly to move the cursor to "FORMAT EXEC" (see page 7-12).

5 Press the SET/FINE/SEARCH button.

A message asking for confirmation of the initialization appears in the display.

To cancel the initialization

Press the UP or DOWN/FREEZE button repeatedly to move the cursor to "NO."

6 **When there is no write-protected cue point data on the memory label**
Press the UP or DOWN/FREEZE button repeatedly to move the cursor to "YES."

When there is write-protected cue point data on the memory label
A message asking for confirmation of the initialization appears in the display again. Press the UP or DOWN/FREEZE button repeatedly to move the cursor to "YES."
The memory label is initialized.

To reset the thread counter recorded on a memory label

Before initializing the memory label, set "THREAD CLEAR" in the TELE FILE menu to "ON" (see page 7-12).

6-1-5 Write-protecting a Memory Label

Use "W PROTECT" in the TELE FILE menu (see page 7-12).

OFF : The memory label is write-enabled.
ON: The memory label is write-protected.

7-1 Setup Menu Configuration

The initial setup menu (referred to as the top menu) gives access to parameters that are divided into ten groups. The top menu for each group is used to display and change the settings of the various items.

In some cases, nested sub-items are displayed in the top menu. The following figure shows the top menus, items, and sub-items as a tree diagram. Note that items enclosed in angle brackets are sub-items.

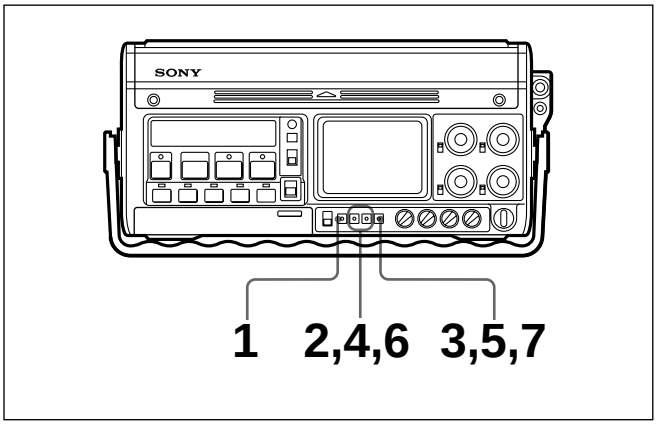
Top menus	Items	Indications on the display
VTR CONTROL	SERVO A/V REFERENCE SELECT	SV/AV REF
	EXTERNAL REFERENCE SELECT	EXT REF
	STILL TIMER	STILL TMR
	SEARCH SPEED	SEARCH
	FREEZE MODE	FREEZE
EDIT	REC MODE	REC MODE
	PREROLL TIME	PREROLL
TIME CODE	REC RUN	REC RUN
	EXTERNAL TC IN	EXT TC IN
	PHASE CORRECTION	PHASE CRC
	TCG CF FLAG	TCG CF FLG
	TC OUT	TC OUT
CHAR OUT	CHARACTER V POSITION	CHAR V
	CHARACTER TYPE	CHAR TYPE
	DISPLAY INFORMATION select	DISP INFO
	CHARACTER WARNING DISPLAY at dual line mode	CHAR WANG
	REMAIN TIME	REMAIN TM
VITC (NTSC)	VITC (NTSC)	VITC/NTSC
	VITC POSITION-1 select (NTSC)	VITC POSI1
	VITC POSITION-2 select (NTSC)	VITC POSI2
VIDEO (HD)	SDI OUT	SDI OUT
	MASTER LEVEL	MSTR LEV
	Y LEVEL	Y LEVEL
	P_B LEVEL	PB LEVEL
	P_R LEVEL	PR LEVEL
	SETUP LEVEL (HD)	SETUP LEV
	SYNC PHASE (HD)	SYNC PHSE
	FINE (HD)	FINE
	ROUNDING	ROUNDING

7-1 Setup Menu Configuration

Top menus	Items		Indications on the display
VIDEO (NTSC)	DOWNCONVERTER OUT		D. CONV OUT
	DOWNCONVERTER MODE		D. CONV MOD
	LETTER BOX MODE		LBOX MODE
	H CROP POSITION		H CROP PS
	SETUP LEVEL (NTSC)		SETUP NTS
	SYNC PHASE (NTSC)		SYNC NTSC
	FINE (NTSC)		FINE NTSC
	CROSS COLOR		CROSS COL
	DETAIL GAIN		DETAIL GA
AUDIO	INPUT 1/2		INPUT 1/2
	INPUT 3/4		INPUT 3/4
	EMPHASIS		EMPHASIS
	DOUBLE REC		DOUBL REC
	PB VOLUME		PB VOLUME
TELE FILE	TELE FILE POP UP		T/F P-UP
	<TELE FILE FORMAT>	THREAD CLEAR	THREAD CLER
		WRITE PROTECT	W PROTECT
		FORMAT EXEC	FORMAT EXEC
SYSTEM	VIDEO TEST SG		V TEST SG
	AUDIO TEST SG		A TEST SG
	CAMERA POWER SUPPLY		CAM POWER
	<DISPLAY SELECT>	IN/OUT SIGNAL	IN/OT SIG
		INFORMATION	INFORMATI
		TELE FILE	TELE FILE
		ERROR LOG	ERROR LOG
		RF CHECK	RF CHECK
		CHANNEL CONDITION	CHANNEL
	<LOAD/SAVE>	LOAD	LOAD
		<SAVE> SAVE	SAVE
	<REMOTE>	REMOTE	REMOTE
		BAUD RATE	BAUD
		CAMERA REMOTE	CAM REMOT
	<SYSTEM>	FREQUENCY	FREQUENCY
		HD LINE	HD LINE
TRACKING	AUTO TRACKING		AUTO TRCK

7-2 Basic Setup Procedure

Using the setup menus

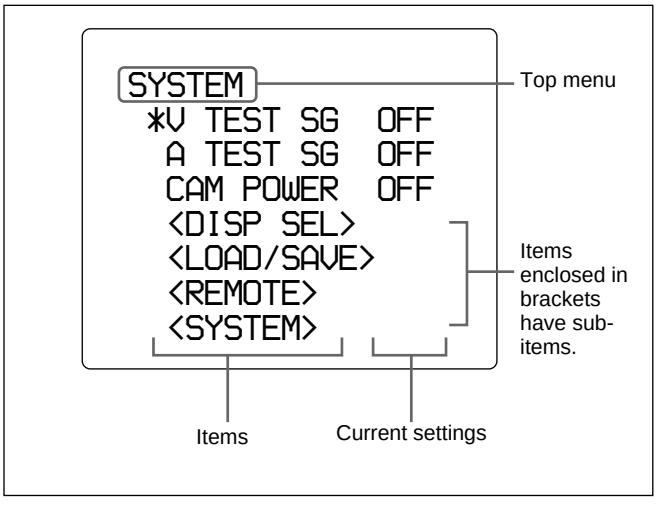


Using the setup menus

1 Press the DISPLAY button in the adjustment controls repeatedly until the list of top menus and their items appear in the signal level and menu panel.

2 Press the UP or DOWN/FREEZE button repeatedly to move the asterisk cursor (*) to the item to be changed.

To move to the first item of the next top menu
Hold down the UP or DOWN/FREEZE button.



3 Press the SET/FINE/SEARCH button to select the item to be changed.

If you select an item enclosed in angle brackets
More sub-items will appear when you press the SET/FINE/SEARCH button.

If you select an item enclosed in angle brackets
Go to step **5**.

4 Press the UP or DOWN/FREEZE button repeatedly to move the asterisk cursor to the sub-item to be changed.
When more items are displayed when you press the SET/FINE/SEARCH button, repeat step **3** and this step.

5 Press the SET/FINE/SEARCH button to select the item (or sub-item).
The current setting of the selected item flashes.

6 Press the UP or DOWN/FREEZE button repeatedly to change the setting.

To restore the item to its factory setting
Press the UP button and DOWN/FREEZE button simultaneously.

7 After you've made the desired change, press the SET/FINE/SEARCH button.
The change is entered. To change another item, repeat this procedure starting with step **4**.

To return to the parent menu
Move the asterisk cursor to EXIT and press the SET/FINE/SEARCH button, or press the DISPLAY button.

Saving and recalling the setup menu settings

Up to three sets of setup menu settings can be saved to the VTR's memory bank for future recall.

To save the current setup menu settings

Set SAVE in the SYSTEM menu (see page 7-14) to the number of the memory bank (1 to 3) where you wish to save the settings, and then press the SET/FINE/SEARCH button.

To recall saved setup menu settings

Set LOAD in the SYSTEM menu (see page 7-14) to the number of the memory bank (1 to 3) from which you want to recall the settings, and then press the SET/FINE/SEARCH button.

To restore the factory-set setup menu settings

Set LOAD in the SYSTEM menu (see page 7-14) to 0, and then press the SET/FINE/SEARCH button.

7-3 Setup Menu Items and Their Functions

Items in the setup menus are divided into categories according to the functions they perform. Descriptions of items in all categories are given below:

- Items related to VTR operations (VTR CONTROL menu)
- Items related to editing (EDIT menu)
- Items related to time code (TIME CODE menu)
- Items related to character superimposition (CHAR OUT menu)
- Items related to VITC (NTSC) (VITC (NTSC) menu)
- Items related to the HD video control (VIDEO (HD) menu)
- Items related to NTSC video control (VIDEO (NTSC) menu)
- Items related to audio control (AUDIO menu)
- Items related to Tele File (TELE FILE menu)
- Items related to system operations (SYSTEM menu)
- Items related to tracking (TRACKING menu)

Items Related to VTR Operations (VTR CONTROL Menu)

The factory setting for each item appears in the box in the Settings column.

Item	Settings	Function
SV/AV REF (SERVO A/V REFERENCE SELECT)	[INP] EXT	The servo reference is determined by the following settings: **INP**: The reference signal is obtained from the signal which is input from the connector specified by the video input switch (the CAMERA connector or HD SDI IN connector). **EXT**: The reference signal is an external signal input from the REFERENCE IN connector. When no signal is input from the REFERENCE IN connector, the servo locks to the internal reference signal.
EXT REF (EXTERNAL REFERENCE SELECT)	[HD] NTSC	When SV/AV REF is set to EXT, use this item to specify the reference signal input from the REFERENCE IN connector. **HD**: A trilevel sync signal whose scanning frequency and field frequency is 1125/59.94 or 1125/60 will be the reference signal for playback and audio recording. To specify the field frequency of the reference signal, use FREQUENCY in the SYSTEM menu (see page 7-14). **NTSC**: A video signal with a chroma burst signal (VBS) or black and white video signal (VS) will be the reference signal for playback and audio recording.
STILL TMR (STILL TIMER)	0.5S 5S 10S 20S 30S 40S 50S 1M 2M 3M 4M 5M 6M 7M [8M] 9M 10M 15M 30M	When the VTR is stopped or in still-picture search mode, the drum rotation automatically stops after an elapse of time specified by this item to protect the video heads and the tape. A time of 0.5 second to 30 minutes can be specified.
SEARCH (SEARCH SPEED)	×2 [X5] ×8	Select the search speed with the F FWD ▶▶ button or REW ◀◀ button. ×**2**: 2 times normal speed ×**5**: 5 times normal speed ×**8**: 8 times normal speed
FREEZE (FREEZE MODE)	[FLD] FRM	Specifies the freeze mode. **FLD**: Freezes a single field. **FRM**: Freezes a single frame.

Items Related to Editing (EDIT Menu)

The factory setting for each item appears in the box in the Settings column.

Item	Settings	Function
REC MODE (REC MODE)	CRUSH [ASM] AUTO	Selects the recording mode. **CRUSH**: When recording ends, the VTR stops at the EOS and the next recording starts from that point. Continuity in the video signal is not maintained. When you press the PREROLL button while in crush recording mode, the VTR pre-rolls to the EOS of last recording or the IN point. **ASM**: When recording ends, the VTR cues up to a point about three seconds before the EOS and stops there until the start of the next recording. Continuity of the video signal is thus maintained. When you start the next recording from any point on the tape other than the EOS, the VTR advances the tape for about three seconds, then starts recording. When you press the PREROLL button while in assemble recording mode, the VTR pre-rolls to a point about three seconds before the EOS of last recording or to the IN point. To perform tag recording to the EOS of last recording or the IN point after transporting the tape after recording, be sure to press the PREROLL button. **AUTO**: The VTR records in automatic assemble mode. When recording ends, the VTR cues up to the point about three seconds before the EOS and stops for the next recording. Therefore, the continuity of the video signal is maintained. Even when you start next recording from any point on the tape other than EOS and IN point, the VTR pre-rolls to a point three seconds before the EOS or IN point, and starts recording. When you press the PREROLL button while in automatic assemble recording mode, the VTR cues to a point about three seconds before the EOS of last recording or the IN point.
PREROLL (PREROLL TIME)	0S | [5S] | 30S	Specifies the pre-roll time for editing using the remote controller or another device connected to the REMOTE connector. A pre-roll time of 0 to 30 seconds (in 1-second steps) can be specified. Generally, a pre-roll time of 3 seconds or longer is set; for phase adjustments using the remote controller, a pre-roll time of 5 seconds or longer is recommended.

Items Related to Time Code (TIME CODE Menu)

The factory setting for each item appears in the box in the Settings column.

Item	Settings	Function
REC RUN (REC RUN)	[INT] TAPE	Selects the time code to be recorded when the F-RUN/R-RUN switch is set to R-RUN. **INT**: Time code produced by the time code generator is recorded. **TAPE**: Time code recorded on the tape is recorded.
EXT TC IN (EXTERNAL TC IN)	[TC IN] SDI	Selects the source of the time code when the VTR's internal time code generator is locked to an external time code. **TC IN**: The VTR's internal time code generator locks to the time code input from the TC IN connector. **SDI**: The VTR's time code generator locks to the VITC input from the HD SDI IN connector.
PHASE CRC (PHASE CORRECTION)	[OFF] ON	Specifies whether to phase correction control is performed for the LTC generated by the time code generator. **OFF**: Phase correction control is not performed. **ON**: Phase correction control is performed.
TCG CF FLG (TCG CF FLAG)	[OFF] ON	Specifies whether a color frame flag is set in the blank bit of the time code data or not. **OFF**: A color frame flag is not set in the blank bit. **ON**: A color frame flag is set in the blank bit.
TC OUT (TC OUT)	[GEN] AUTO	Specifies the signal output to the TC OUT connector. **GEN**: Time code from the internal time code generator is output. **AUTO**: Time code from the internal time code generator is output during recording and in E-E mode. LTC recorded on the tape is output during playback.

Items Related to Character Superimposition (CHAR OUT Menu)

The factory setting for each item appears in the box in the Settings column.

Item	Settings	Function
CHAR V (CHARACTER V POSITION)	0 | [22] | 23	Specifies the vertical position for text information (such as time code superimposed on the signal output to the ANALOG HD COMPONENT MONITOR OUT connector and COMPOSITE MONITOR OUT connector when the SUPERIMPOSE switch is set to ON). A 0 setting specifies the bottom of the monitor screen, and higher settings (0 to 23) specify correspondingly higher vertical positions. **Note** If a setting other than TIME is selected for DISP INFO in the CHAR OUT menu, the center part of the second line of the superimposed text may not be visible.
CHAR TYPE (CHARACTER TYPE)	W/O OUTL TRNS [BG]	Specifies the style of the text (such as time code superimposed on the signal output to the ANALOG HD COMPONENT MONITOR OUT connector and COMPOSITE MONITOR OUT connector when the SUPERIMPOSE switch is set to ON). **W/O**: White characters with no background. **OUTL**: White characters outlined in black. **TRNS**: White characters on a gray background. However, text always appears as white characters on a black background on the monitor screen connected to the COMPOSITE MONITOR OUT connector. **BG**: White characters on a black background.
DISP INFO (DISPLAY INFORMATION select)	STAT UB CTL VITC [TIME]	Specifies the contents of the text information superimposed on the signal output to the ANALOG HD COMPONENT MONITOR OUT connector and COMPOSITE MONITOR OUT connector when the SUPERIMPOSE switch is set to ON. **STAT**: time code information and VTR operation mode **UB**: time code information and user's bits **CTL**: time code information and CTL **VITC**: time code information and VITC **TIME**: time code information only
CHAR WANG (CHARACTER WARNING DISPLAY at dual line mode)	[OFF] ON	If a setting other than TIME is selected for DISP INFO in the CHAR OUT menu, this item specifies whether warning messages flash on the second line or not. **ON**: Warning messages flash. **When there are multiple messages** Each message flashes twice before it is replaced by the next message. **When there is no warning message** The items selected by DISP INFO flash. **To set each warning message so that it does not appear in the monitor display** *See "Non-display and saving of error/warning messages in the error log" on page A-5.* **OFF**: Warning messages do not flash.
REMAIN TM (REMAIN TIME)	[OFF] ON 10M	Specifies whether the remaining time on tape is added to the text information superimposed on the signal output to the ANALOG HD COMPONENT MONITOR OUT connector and COMPOSITE MONITOR OUT connector when the SUPERIMPOSE switch is set to ON. **OFF**: Remaining time on the tape is never added. **ON**: Remaining time on the tape is always added. **10M**: Remaining time on the tape is added only when the remaining time is 10 minutes or less.

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Items Related to VITC (NTSC) (VITC (NTSC) Menu)

The factory setting for each item appears in the box in the Settings column.

Item	Settings	Function
VITC/NTSC VITC (NTSC)	[ON] OFF	Specifies whether VITC is inserted in the signal output to the COMPOSITE MONITOR OUT connector. **ON**: VITC is inserted. **OFF**: VITC is not inserted.
VITC POSI1 VITC POSITION-1 select (NTSC)	12LN | [16LN] | 20LN	Specifies the line on which VITC is inserted in the signal output to the COMPOSITE MONITOR OUT connector. The VITC can be inserted on any lines from 12 to 20. VITC POSI1 and VITC POSI2 allow VITC to be inserted on two lines.
VITC POSI2 VITC POSITION-2 select (NTSC)	12LN | [18LN] | 20LN	Specifies the line on which VITC is inserted in the signal output to the COMPOSITE MONITOR OUT connector. The VITC can be inserted on any line from 12 to 20. VITC POSI1 and VITC POSI2 allow VITC to be inserted on two lines.

Items Related to HD Video Control (VIDEO (HD) Menu)

The factory setting for each item appears in the box in the Settings column.

Item	Settings	Function
SDI OUT (SDI OUT)	[AUTO] OFF ON	Turns the output of the signal at the HD SDI OUT connector on or off. **AUTO**: The signal output is turned off when the MODE switch is set to SAVE. **OFF**: The signal output is turned off at all times. **ON**: The signal is always output.
MSTR LEV (MASTER LEVEL) Preset: 100.0%	0.0 | [100.0] | 141.3	Adjusts the Y, P_B, and P_R levels of the high-definition video signal output to the HD SDI OUT connector and ANALOG HD COMPONENT MONITOR OUT connector, and the Y, B-Y, and R-Y levels of the analog composite video signal output to the COMPOSITE MONITOR OUT connector. The Y, P_B, and P_R levels and Y, R-Y, and B-Y levels are adjusted simultaneously.
Y LEVEL (Y LEVEL) Preset: 100.0%	0.0 | [100.0] | 141.3	Adjusts the Y level of the high-definition video signal output to the HD SDI OUT connector and ANALOG HD COMPONENT MONITOR OUT connector, and the Y level of the analog composite video signal output to the COMPOSITE MONITOR OUT connector.
PB LEVEL (P_B LEVEL) Preset: 100.0%	0.0 | [100.0] | 141.3	Adjusts the P_B level of the high-definition video signal output to the HD SDI OUT connector and ANALOG HD COMPONENT MONITOR OUT connector, and the B-Y level of the analog composite video signal output to the COMPOSITE MONITOR OUT connector.
PR LEVEL (P_R LEVEL) Preset: 100.0%	0.0 | [100.0] | 141.3	Adjusts the P_R level of the high-definition video signal output to the HD SDI OUT connector and ANALOG HD COMPONENT MONITOR OUT connector, and the R-Y level of the analog composite video signal output to the COMPOSITE MONITOR OUT connector.
SETUP LEV (SETUP LEVEL (HD)) Preset: 0.0	–10.0 | [0.0] | 10.0	Adjusts the black level of the high-definition video signal output to the HD SDI OUT connector and ANALOG HD COMPONENT MONITOR OUT connector, and the black level of the analog composite video signal output to the COMPOSITE MONITOR OUT connector.
SYNC PHSE (SYNC PHASE (NTSC)) Preset: 0	–36 | [0] | 36	Specifies the H-sync phase of the high-definition video signal output to the HD SDI OUT connector and ANALOG HD COMPONENT MONITOR OUT connector.
FINE (FINE (HD)) Preset: 0	[0] | 1024	Specifies very precisely the H-sync phase of the high-definition video signal output to the HD SDI OUT connector and ANALOG HD COMPONENT MONITOR OUT connector.
ROUNDING (ROUNDING)	[SIMP] ADAP	Specifies whether A-ROUNDING™[1)] is performed. **SIMP**: A-ROUNDING™ is not performed. 10-bit input signals are changed to 8-bit signals by normal rounding (rounding down numbers of 4 or less and rounding up numbers 5 or more). **ADAP**: A-ROUNDING™ is performed. 10-bit input signals are rounded to produce 8-bit signals.

1) **A-ROUNDING™**
A method for rounding that changes a 10-bit signal to an 8-bit signal. This process suppresses step noise that occurs on displays in which lines deviate slightly from the horizontal. A-ROUNDING is a trademark of Sony Corporation.

Items Related to NTSC Video Control (VIDEO (NTSC) Menu)

The factory setting for each item appears in the box in the Settings column.

Item	Settings	Function
D. CONV OUT (DOWNCONVERTER OUT)	[AUTO] OFF ON	Turns signal output of the COMPOSITE MONITOR OUT connector on or off. **AUTO**: The signal output is turned off when the MODE switch is set to SAVE. **OFF**: The signal output is turned off at all times. **ON**: The signal is always output.
D. CONV MOD (DOWNCONVERTER MODE)	[CROP] LBOX SQUZ	Specifies the mode of the signal output to the COMPOSITE MONITOR OUT connector. **CROP**: Edge-crop mode is selected. **LBOX**: Letter box mode is selected. **SQUZ**: Squeeze mode is selected.
LBOX MODE (LETTER BOX MODE)	[16:9] 14:9 13:9	When D. CONV MOD is set to “LBOX,” this setting specifies the aspect ratio of the HD-SD converter output. **16:9**: The aspect ratio of the down converted output is 16:9. **14:9**: The aspect ratio of the down converted output is 14:9. **13:9**: The aspect ratio of the down converted output is 13:9.
H CROP PS (H CROP POSITION) Preset: 0	–120 | [0] | 120	Adjusts the H-crop (cropping position in the horizontal direction when using the edge crop mode).
SETUP NTS (SETUP LEVEL (NTSC)) Preset: 7.5 IRE	0.0 | [7.5] | 10.0	Adjusts the setup level of the analog composite video signal output to the COMPOSITE MONITOR OUT connector.
SYNC NTSC (SYNC PHASE (NTSC)) Preset: 0	–128 | [0] | 127	Adjusts the sync phase of the analog composite video signal output to the COMPOSITE MONITOR OUT connector.
FINE NTSC FINE (NTSC) Preset: 0	[0] | 1024	Precisely adjusts the sync phase of the analog composite video signal output to the COMPOSITE MONITOR OUT connector.
CROSS COL (CROSS COLOR) Preset: 8	0 | [8] | 15	Adjusts the cross color of the analog composite video signal output to the COMPOSITE MONITOR OUT connector.
DETAIL GA (DETAIL GAIN) Preset: 32	0 | [32] | 127	Adjusts the image enhancer of the analog composite video signal output to the COMPOSITE MONITOR OUT connector. Adjusts the sharpness of the edge enhancement.

Items Related to Audio Control (AUDIO Menu)

The factory setting for each item appears in the box in the Settings column.

Item	Settings	Function
INPUT 1/2 (INPUT 1/2)	ANA [DIGI]	Specifies the audio input for channels 1 and 2 when digital video input is selected. **ANA**: Analog audio input is selected. **DIGI**: Digital audio input is selected.
INPUT 3/4 (INPUT 3/4)	ANA [DIGI]	Specifies the audio input for channels 3 and 4 when digital video input is selected. **ANA**: Analog audio input is selected. **DIGI**: Digital audio input is selected.
EMPHASIS (EMPHASIS)	[OFF] ON	Turns the emphasis on analog audio input on or off. **OFF**: Emphasis is not applied. **ON**: Emphasis is applied.
DOUBL REC (DOUBLE REC)	[OFF] ON	Specifies whether the same signal or different signals are recorded on audio channels 1 and 2 and channels 3 and 4. **OFF**: Different signals are recorded on channels 1/2 and channels 3/4. **ON**: The same signal is recorded on channels 1/2 and channels 3/4.
PB VOLUME (PB VOLUME)	[UNITY] VAR	Enables or disables the level adjustment of signals output to the HD SDI OUT connector and AUDIO OUT connector by the AUDIO PB LEVEL controls. **UNITY**: The AUDIO PB LEVEL controls are disabled. The signals are output in the same level as recorded. **VAR**: The AUDIO PB LEVEL controls are enabled.

Items Related to Tele File (TELE FILE Menu)

The factory setting for each item appears in the box in the Settings column.

Item	Sub-item	Settings	Function
T/F P-UP (TELE FILE POP UP)		[OFF] ON	Specifies whether the TELE FILE menu is displayed in the signal level and menu panel automatically or not when a cassette with a memory label is inserted. **OFF**: The TELE FILE menu is not automatically displayed. **ON**: The TELE FILE menu is automatically displayed.
T/F FORMAT (TELE FILE FORMAT)			Makes settings related to the initialization of an MLB-1B-100 memory label (not supplied).
	THREAD CLEAR (THREAD CLEAR)	[OFF] ON	Specifies whether the thread counter recorded on the memory label is cleared or not when the memory label is initialized. **OFF**: The thread counter is not cleared. **ON**: The thread counter is cleared.
	W PROTECT (WRITE PROTECT)	[OFF] ON	Specifies whether the memory label is write-protected or not. **OFF**: The memory label is not write-protected. **ON**: The memory label is write-protected.
	FORMAT EXEC (FORMAT EXEC)		Initializes a memory label. Press the SET/FINE/SEARCH button to start the initialization.

Items Related to System Operations (SYSTEM Menu)

The factory setting for each item appears in the box in the Settings column.

Item	Sub-item	Settings	Function
V TEST SG (VIDEO TEST SG)		[OFF] CB (100% color bar) RMP (ramp) TEN (ten steps) GRY (gray)	Specifies the video test signal output by the internal signal generator of the VTR. **OFF**: A video test signal is not generated and the VTR operates normally. **All other settings**: The selected video test signal is output. It is possible to record the test signal in these cases.
A TEST SG (AUDIO TEST SG)		[OFF] 1K/1 1K/2	Specifies the operation of the audio test signal generator of the VTR. **OFF**: An audio test signal is not output. **1K/1**: A 1-kHz –18 dB FS sine wave is supplied to all audio output connectors. **1K/2**: A 1-kHz –20 dB FS sine wave is supplied to all audio output connectors.
CAM POWER (CAMERA POWER SUPPLY)		[OFF] ON	Specifies the supply of power to the camera connected to the CAMERA connector. **OFF**: Power is not supplied to the camera. **ON**: Power is supplied to the camera. **Notes** • The BP-90A does not have sufficient capacity to supply power to the camera. • Use the BP-L90A Battery Pack to supply power to the camera from a battery pack. • Use the AC-DN 2A AC Adaptor to supply power to the camera through the AC power source.
DISP SEL (DISPLAY SELECT)			Allows display items to be selected by pressing the DISPLAY button repeatedly.
	IN/OT SIG (IN/OUT SIGNAL)	[ON] OFF	Specifies whether or not the video level meters appear when the DISPLAY button is pressed repeatedly. **ON**: The video level meters appear. **OFF**: The video level meters do not appear.
	INFORMATI (INFORMATION)	[ON] OFF	Specifies whether or not the INFORMATION screen appears when the DISPLAY button is pressed repeatedly. **ON**: The INFORMATION screen appears. **OFF**: The INFORMATION screen does not appear.
	TELE FILE (TELE FILE)	ON [OFF]	Specifies whether or the TELE FILE menu appears or not when the DISPLAY button is pressed repeatedly. **ON**: The TELE FILE menu appears. **OFF**: The TELE FILE menu does not appear.
	ERROR LOG (ERROR LOG)	ON [OFF]	Specifies whether or not the error log appears when the DISPLAY button is pressed repeatedly. **ON**: The error log appears. **OFF**: The error log does not appear.
	RF CHECK (RF CHECK)	ON [OFF]	Specifies whether or not the RF CHECK screen appears when the DISPLAY button is pressed repeatedly. **ON**: The RF CHECK screen appears. **OFF**: The RF CHECK screen does not appear.
	CHANNEL (CHANNEL CONDITION)	ON [OFF]	Specifies whether or not the CHANNEL screen appears when the DISPLAY button is pressed repeatedly. **ON**: The CHANNEL screen appears. **OFF**: The CHANNEL screen does not appear.

Item	Sub-item	Settings	Function
LOAD/SAVE (LOAD/SAVE)			Saves the setup menu settings into one of the VTR's memory banks and recalls them.
	LOAD (LOAD)	[0] 1 2 3	Select the memory bank from which you want to recall the settings, then press the SET/FINE/SEARCH button. **0**: The factory-set settings are recalled. **1**: The settings saved in memory bank 1 are recalled. **2**: The settings saved in memory bank 2 are recalled. **3**: The settings saved in memory bank 3 are recalled.
	SAVE (SAVE)		
	Nested item		
	SAVE (SAVE)	[1] 2 3	Select the memory bank to which you want to save the current settings, then press the SET/FINE/SEARCH button. **1**: The current settings are saved to memory bank 1. **2**: The current settings are saved to memory bank 2. **3**: The current settings are saved to memory bank 3.
REMOTE (REMOTE)			Makes settings related to remote interface.
	REMOTE (REMOTE)	[9PIN] ISR TELEF	Specifies the interface for which the REMOTE connector is used. **9PIN**: Used as a Sony 9-pin protocol interface. **ISR**: Used as an ISR interface. **TELEF**: Used as an RS-232C interface for the connection of an external personal computer for TELE FILE menu operations.
	BAUD (BAUD RATE)	[19200] 9600 4800 2400 1200	Specifies the baud rate for ISR. **19200**: 19200 bps **9600**: 9600 bps **4800**: 4800 bps **2400**: 2400 bps **1200**: 1200 bps
	CAM REMOT (CAMERA REMOTE)	DIG 700 [AUTO]	Selects the protocol for communication with the VTR and the camera connected to the CAMERA connector. **DIG**: Digital command is used. **700**: The Sony camera system 700 protocol (700 protocol) is used. **AUTO**: The protocol detected by the VTR's protocol auto-detection function is used. **Notes on using the HDC-750/750A HD Portable Video Camera** • When using the HDC-750 and 750A, limitations exist on the software version that can be used. For details, contact you nearest Sony service personnel. • When AUTO is selected on both the VTR and the connected camera, digital command or the 700 protocol is automatically specified when the recording system is started up. To specify either protocol, select 700 or DIG on either the VTR or the camera.
SYSTEM (SYSTEM)			Makes settings related to VTR system operation.
	FREQUENCY (FREQUENCY)	[59.94] 60	Specifies the field frequency to be used. **59.94**: A field frequency of 59.94 Hz is used. **60**: A field frequency of 60 Hz is used.
	HD LINE (HD LINE)	[1035] 1080	Specifies the effective number of recording lines per frame for the high-definition analog component signal. **1035**: 1035 lines per frame. **1080**: 1080 lines per frame.

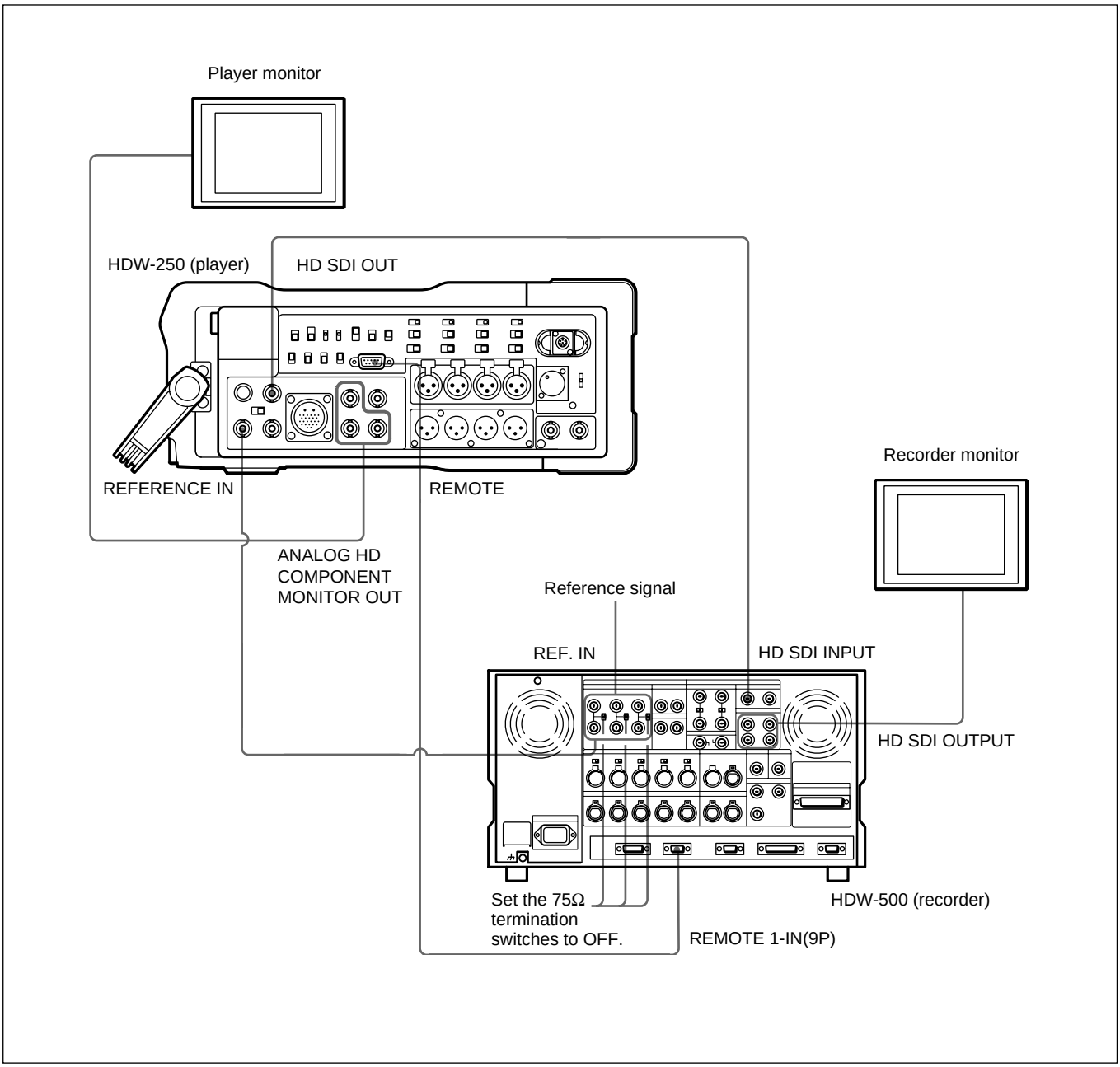
Item Related to Tracking (TRACKING Menu)

The factory setting for the item appears in the box in the Settings column.

Item	Settings	Function
AUTO TRCK (AUTO TRACKING)	OFF [ONE] ON	Specifies whether or not automatic tracking is performed. **OFF**: Automatic tracking is not performed. **ONE**: Automatic tracking is performed only once (when the tape is loaded). **ON**: Automatic tracking is performed continually.

8-1 Configuration in Which an Editor Is Not Used

In the following connection configuration, an HDW-250 is used as a player and an HDW-500 HD Digital Videocassette Recorder as a recorder.



Example of a configuration in which an editor is not used

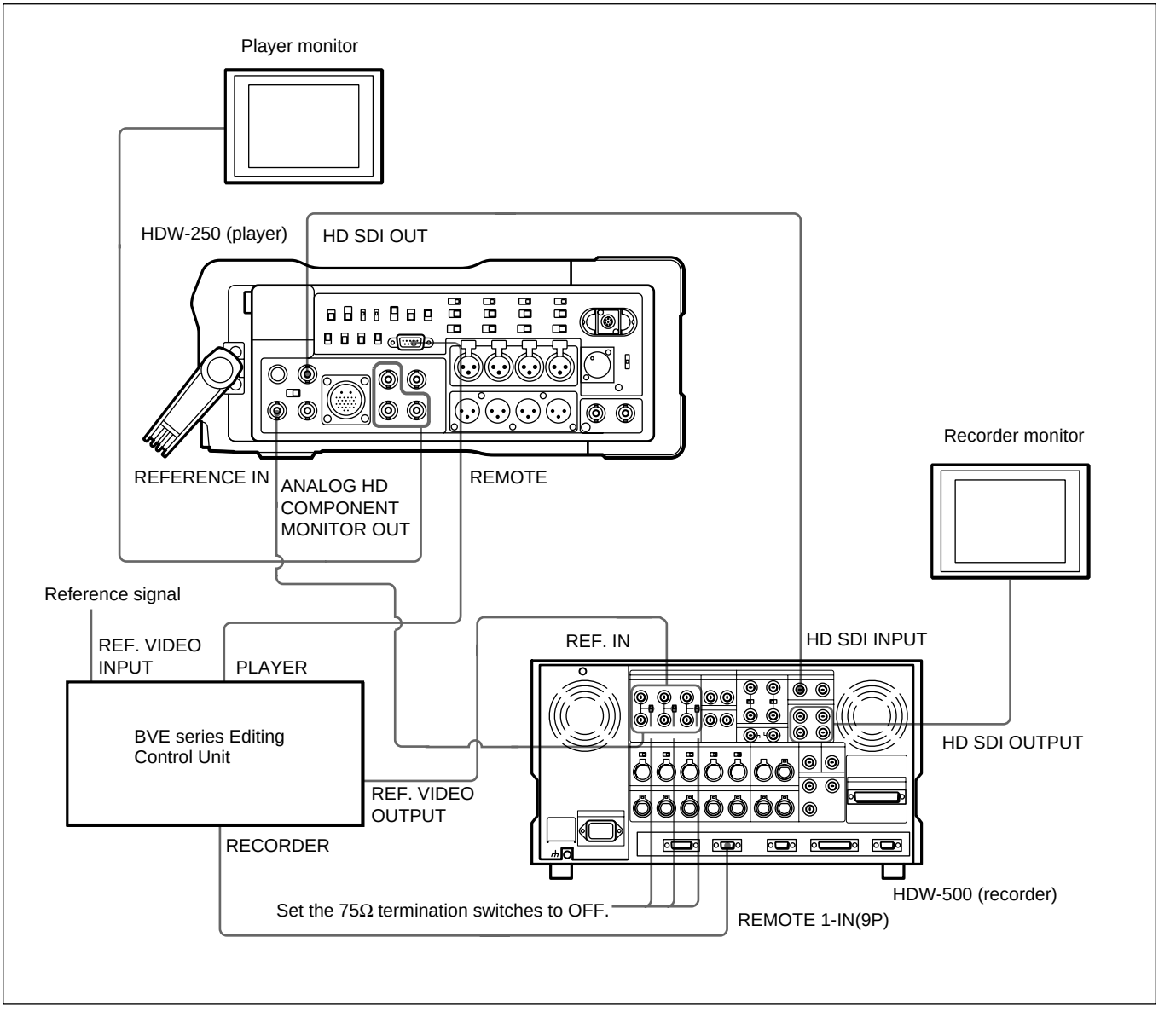
8-2 Configuration in Which an Editor Is Used

Note

- Under the following condition, the signal output from the HD SDI OUTPUT connector advances by 90 lines from the reference signal.
  -During the playback with edit preset ON
  -During the recording with confidence playback ON
- The analog composite signal output from the COMPOSITE MONITOR OUT connector delays by 90 lines to the signal output from the HD SDI OUTPUT connector.

Example 1

In the following connection configuration, the HDW-250 is used as a player, an HDW-500 HD Digital Videocassette Recorder as a recorder, and a BVE series Editing Control Unit as an editor.



Example (1) of a configuration in which an editor is used

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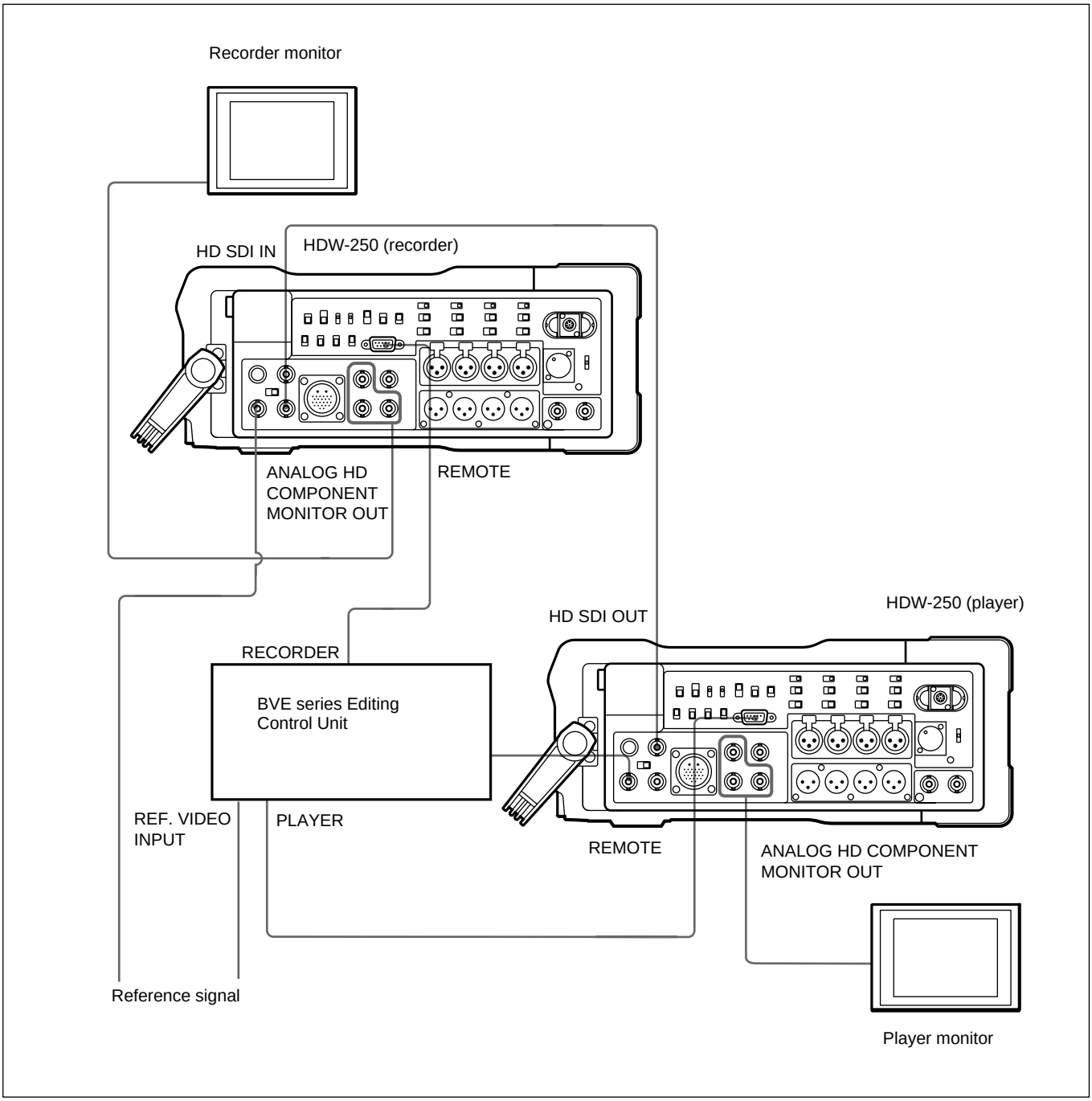
Example 2

In the following connection configuration, two HDW-250 units are used as a recorder and a player, and a BVE series Editing Control Unit is used as an editor.

Note

When an HDW-250 is used as a recorder, only assemble editing is possible.



Example (2) of a configuration in which an editor is used

Error and Warning Messages

When an operational error occurs, a warning is issued in one of the following forms:

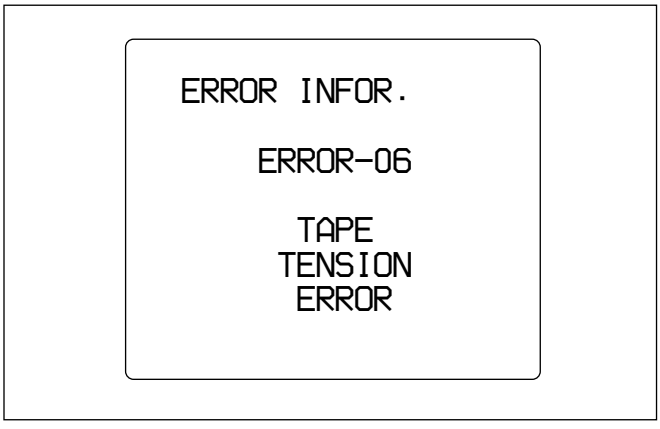
- **Error messages**: These appear on the signal level and menu panel (see "Error Messages" on this page).
- **Warning messages**: These appear in the signal level and menu panel when the INFORMATION screen is selected by the DISPLAY button (see "Warning Messages" on page A-2). When the SUPERIMPOSE switch is set to ON, warning messages also appear on a monitor display.
- **Error/warning indicators**: These appear on the status indication panel.
- **WARNING indicator**: This indicator (located beside the status indication panel) lights up or flashes.
- **Beep**: Beeps are output to the EARPHONE connector and HEADPHONES connector. Beeps can be turned on or off by ALARM in the DIAG menu.

For details on the DIAG menu, refer to the maintenance manual part 1 (supplied).

For details on the error/warning indicators on the status indication panel, WARNING indicator conditions, and warning beeps, see "Error/Warning Indicators on the Status Indication Panel, WARNING Indicator Conditions, and Warning Beeps" on page A-3.

Error Messages

When an operational error occurs, an error message appears on the signal level and menu panel, an error/warning indicator appears on the status indication panel, the WARNING indicator lights up or flashes, and a warning beep is output to the EARPHONE connector and HEADPHONES connector.



Error message

When an error message is displayed, resolve the cause of the error and turn the VTR back on. If the error message appears again when the VTR is turned on, contact your Sony service personnel.

For details on how to resolve the cause of an error, refer to the maintenance manual part 1 (supplied).

Only one message is displayed at a time even when multiple errors occur; the error log, however, maintains a history of all errors.

For details on the error log, see "Error Log" on page A-5.

Error messages and their meanings are listed below:

01 TAPE SLACK AT THREAD: Slack in the tape has been detected during threading or unthreading.

02 TAPE SLACK AT SEARCH: Slack or a break in the tape has been detected during searching, rewinding, or fast-forwarding.

03 TAPE SLACK AT PLAY/REC: Slack or a break in the tape has been detected during playing or recording. Or, the S or T reel is locked.

04 TAPE TROUBLE: An abnormality in tape speed has been detected during fast-forwarding or rewinding.

05 REEL NOT STOPPED: The S or T reel keeps rotating even after the cassette has been unloaded. Or, the current flow for the S or T reel has deviated from the normal range.

06 TAPE TENSION ERROR: Excessive tension on the tape has been detected.

07 CAPSTAN FG ERROR: An abnormality in tape speed has been detected during searching or playing.

08 DRUM FG ERROR: An abnormality has been detected in the drum motor rotation.

09 THREAD/UNTHREAD ERROR: Threading or unthreading did not end within the specified time.

0A THREAD/UNTHREAD SENSOR TROUBLE: An abnormality in threading/unthreading sensor has been detected.

0B CASSETTE COMPARTMENT UP/DOWN SENSOR TROUBLE: An abnormality in the cassette compartment up/down sensor has been detected.

0C THREAD/UNTHREAD AND UP/DOWN SENSOR TROUBLE: An abnormality in the threading/unthreading sensor or cassette compartment up/down sensor has been detected.

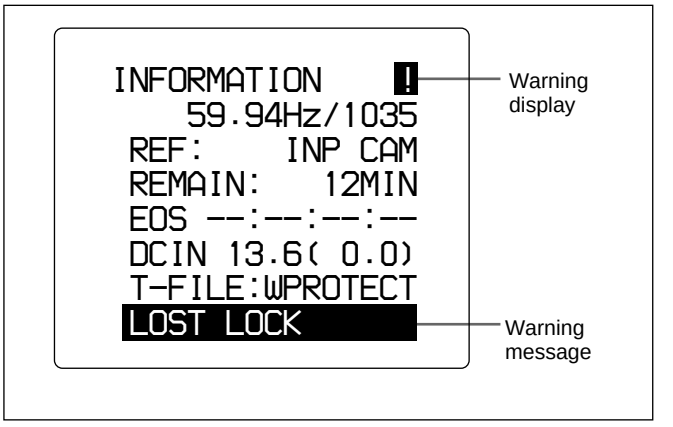
10 HUMID: Condensation has been detected. Wait until this message turns off before operating the VTR again.

11 TAPE TOP/END SENSOR: The top and end of the tape were detected simultaneously.
12 TAPE TOP SENSOR: An abnormality in the tape top sensor has been detected.
13 TAPE END SENSOR: An abnormality in the tape end sensor has been detected
14 FAN TROUBLE: An abnormality in the fan motor has been detected.
20 CASSETTE COMPARTMENT MOTOR LOCKED: The up-and-down operation of the cassette did not finish within the specified time.
97 SV NVRAM ERROR: A check sum error has been detected in the NV-RAM for servo adjustment.
A0 RAM READ WRITE ERROR: An error has occurred during reading and writing to the RAM on the SY (SST-13) internal board.
MAIN SRAM: IC113, 114, 115, 116
MAIN IF: IC513
MAIN SV: IC400
C1 TG NO RESPONSE: No frame pulse from the processor TG is detected.
C2 SV NO RESPONSE: The servo motor has stopped.
C3 FUSE BLOWN: The fuse in the power supply circuit to the connected camera has blown.
C4 BATTERY END: The power of the battery pack has dropped too low to operate the VTR. Replace the battery pack and turn the power of the VTR back on.

Warning Messages

When an operational error has occurred, a warning message appears in the signal level and menu panel and a warning mark also appears and flashes while the warning message is displayed.
When the SUPERIMPOSE switch is set to ON, warning messages also appear on the monitor display.
If any of the following warning messages appears, an error/warning indicator appears on the status indication panel and the WARNING indicator lights up or flashes as well: TAPE END, TAPE NEAR END, BATTERY NEAR END, CAM DC SUPPLY OFFED, CAM DC SUPPLY ON WITH BP90, RF TROUBLE.
A warning beep is also output to the EARPHONE connector and HEADPHONES connector at this time.

For details on the error/warning indicators on the status indication panel, WARNING indicator conditions, and warning beeps, see "Error/Warning Indicators on the Status Indication Panel, WARNING Indicator Conditions, and Warning Beeps" on page A-3.



Warning message

Note

The VTR continues to operate even when a warning message appears. Before using the VTR again, however, you should resolve the reason for the message in order to clear the message from the display, and check the specification for the display or non-display of warning messages.

For details on the resolution of causes of warning messages, refer to the maintenance manual part 1 (supplied).

For setting each warning message so that it is not displayed, see "Non-display and saving of error/warning messages in the error log" on page A-5.

Only one message is displayed at a time even when multiple errors occur; the error log, however, maintains a history of all errors.

For details on the error log, see "Error Log" on page A-5.

The warning messages and their meanings are listed below:
BATTERY NEAR END: The voltage of the battery pack has fallen into the warning range.
CAM DC SUPPLY OFFED: To maintain power to the VTR, power from the BP-90A to the camera has been cut.
CAM DC SUPPLY ON WITH BP90: The power supply to the camera has been set to on with the use of the BP-90A.
INVALID SDI: The serial digital input signal data is invalid.
LOST LOCK: Capstan servo lock has been lost during playback, recording or editing.
NO CAM INPUT: The signal input from the CAMERA connector has been specified as the servo reference signal, but there is no signal input from that connector.

NO EXTERNAL REFERENCE VIDEO: The specified reference signal has not been input.

NO LTC REPRODUCED: LTC is not recorded on the tape.

NO PB RF: The playback heads cannot read digital data from the tape correctly.

NO SDI INPUT: The signal input from the HD SDI IN connector has been specified as the servo reference signal, but there is no signal input from that connector.

PREROLL FAILED: Prerolling to a cue point has not been completed because of some reason: e.g. no existence on the tape of the time code which has been set as a cue point. When this warning message is displayed, confirm the position where the tape has been stopped before the next recording.

RF TROUBLE: An abnormality in RF level has been detected during playback or recording.

ASM IN ERROR: During recording in assemble mode or automatic assemble mode, the continuity of the video signal was broken because of a discontinuity in the time code in the pre-roll segment of the source tape, or because of the lack of a specified recording starting point on the destination tape.

TAPE END: End of tape is detected.

TAPE NEAR END: Remaining time on the tape is running out.

TELEFILE ERROR: An error has been detected during a memory label writing or reading operation.

VIDEO PLL UNLOCKED: The video clock generator PLL is not locked to the input video reference signal.

Error/Warning Indicators on the Status Indication Panel, WARNING Indicator Conditions, and Warning Beeps

When an error message or a warning message is issued, an error/warning indicator appears on the status indication panel, the WARNING indicator lights up or fl-ashes, and a beep is output to the EARPHONE connector and HEADPHONES connector. Use the following table to determine the appropriate measures to be taken to resolve the error.

To turn off the beep

Set ALARM in the DIAG menu to OFF.

For details on the DIAG menu, refer to the maintenance manual part 1 (supplied).

Message	Error/warning indicator(s)	WARNING indicator	Beep	VTR action	Cause	Remedy
Error message	SERVO lights up	Flashes (4 times/second)	Continuous	Recording continues only if possible. Or all operations are canceled.	The servo lock has been lost.	For information on resolving the problem, refer to maintenance manual part 1 (supplied).
	HUMID lights up	Lights up	Continuous	Recording continues. If the tape is stuck on the head drum, recording stops. Playback, fast-forwarding, or rewinding stops.	Condensation has formed.	Stop the tape. Keep the VTR turned on and wait until the HUMID indicator turns off.
	SLACK lights up	Flashes (4 times/second)	Continuous	Recording stops.	Tape is not wound properly.	Eject the cassette. For details, refer to the maintenance manual part 1 (supplied).
	RF, SERVO, HUMID, and SLACK flash	Flashes (4 times/second)	Continuous	Recording continues only if possible. Or all operations are canceled.	System error has occurred.	For information on resolving the problem, refer to maintenance manual part 1 (supplied).
	BATT flashes (1 time/ second)	Lights up	Continuous	Recording stops.	Battery pack has exhausted.	Replace the battery pack and turn the VTR back on.

Error and Warning Messages

Message	Error/warning indicator(s)	WARNING indicator	Beep	VTR action	Cause	Remedy
Warning message	TAPE flashes (1 time/ second)	Flashes (1 time/second)	One beep per second	Recording continues.	Tape is running out.	Replace the cassette if necessary.
		Lights up	Continuous	All operations are canceled.	End of tape.	Replace the cassette.
	BATT flashes (1 time/ second)	Flashes (1 time/second)	One beep per second	Recording continues.	Voltage of the battery pack has fallen into the warning range.	Replace the battery pack.
		Flashes (4 times/second)	Four beeps per second	Power to the camera will be cut off when the power source switches to the battery pack.	Power is currently being supplied from an external AC power source, but the BP-90A Battery Pack is inserted and CAM POWER in the SYSTEM menu is set to ON.	Do one of the following: • Remove the BP-90A or replace it with the BP-L60A. • Set CAM POWER in the SYSTEM menu to OFF.
		Flashes (4 times/second)	Continuous	Power to the camera has been cut off.	An attempt was made to supply power to the camera from a BP-90A.	Do one of the following: • Supply power to the VTR and the camera using an external AC power source. • Remove the BP-90A or replace it with a BP-L60A. • Set CAM POWER in the SYSTEM menu to OFF.
	RF lights up	Flashes (4 times/second)	Four beeps per second	Recording continues but recording may not be done properly. Proper playback may also not be possible.	Video heads may be clogged, or there is some other fault in recording/ playback system.	Clean the heads with a BCT-HD12CL Cleaning Cassette. If RF remains on after the head cleaning, turn off the VTR and consult your Sony service personnel.

Error Log

The error log records the time and time code at which all errors and warning messages were output during VTR operations and the VTR condition. The error log can contain a maximum of 99 items.

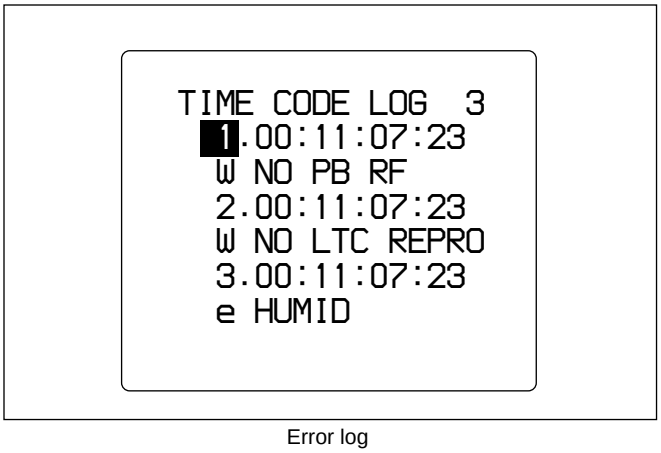
Displaying the error log

Do one of the following:

- Press the DIAG button to display the DIAG menu, and then select ALARM, ERROR LOG, and then LOG.

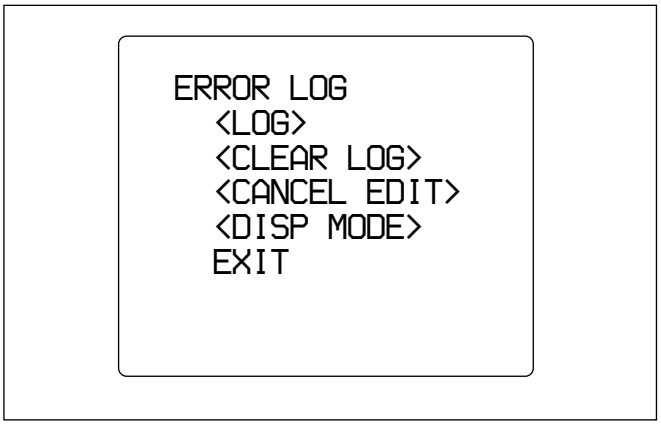
For details on the DIAG menu, refer to the maintenance manual part 1 (supplied).

- Set ERROR LOG (under DISPLAY SEL in the SYSTEM menu) to ON (see page 7-13). When this sub-item is set to ON, pressing the DISPLAY button (of the display buttons) repeatedly displays the error log.



Error log

When you press the DIAG button to display the DIAG menu and select ALARM, and then ERROR LOG, the ERROR LOG menu appears and the following settings can be made.



ERROR LOG menu

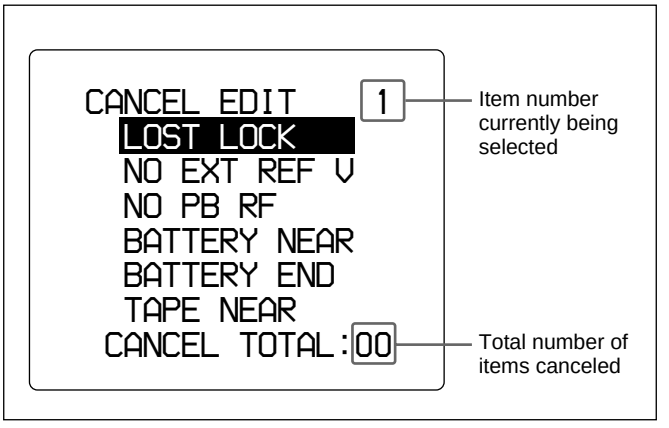
LOG: Displays the error log.
CLEAR LOG: Clears the error log.
CANCEL EDIT: Jumps to CANCEL EDIT in the DIAG menu.
DISP MODE: Allows the four following menus to be selected:
DISP TIME: Selects the time code or actual time indication on the log.
TC: Displays time code or CTL.
TREAL: Displays the actual time.
ERROR: Specifies whether or not error messages are displayed on the log.
ON: Error messages are displayed.
OFF: Error messages are not displayed.
WARNING: Specifies whether or not warning messages are displayed on the log.
ON: Warning messages are displayed.
OFF: Warning messages are not displayed.
CONDITION: Specifies whether or not the VTR condition is displayed on the log.
ON: VTR condition is displayed.
OFF: VTR condition is not displayed.

Non-display and saving of error/warning messages in the error log

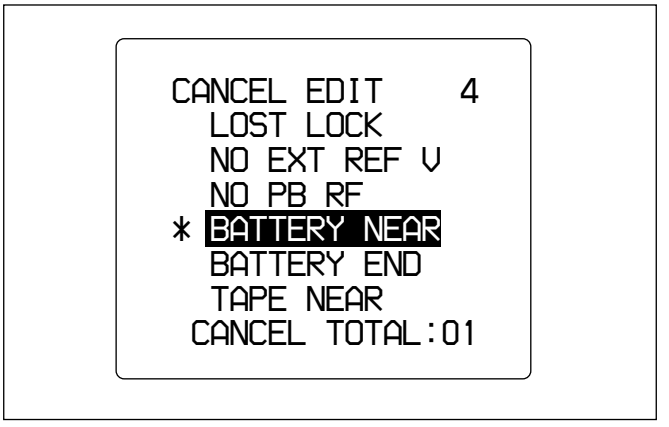
Each error message and warning message can independently set so that it is not displayed or saved in the error log. When specified, messages will no longer appear in the signal level and menu panel or the monitor display, and will no longer be recorded in the error log.

1 Press the DIAG button.
The DIAG menu appears.

2 Select ALARM, ERROR LOG, and then CANCEL EDIT.



3 Press the UP button or DOWN/FREEZE button repeatedly to select the message to be canceled, and press the SET/FINE/SEARCH button.



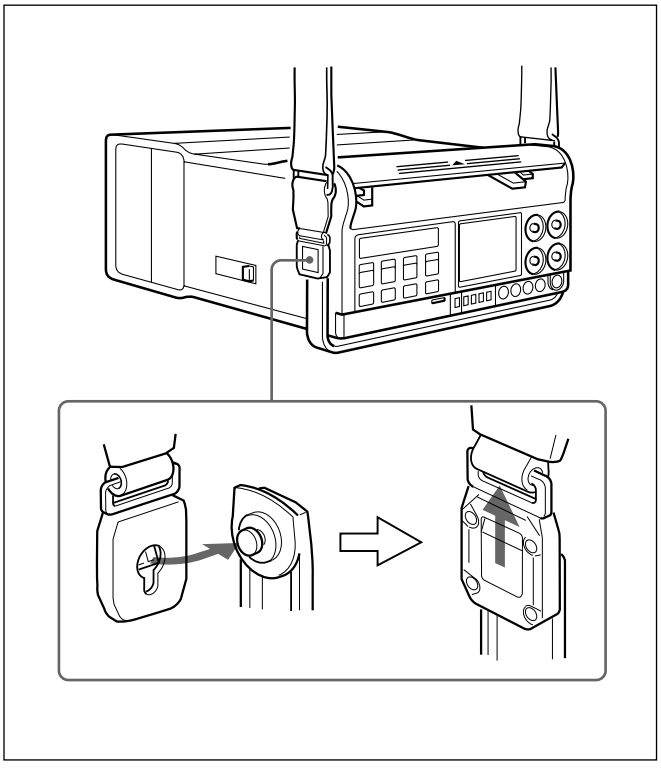
An asterisk appears to the left of a canceled message. Canceled messages are no longer displayed or recorded in the error log.

To display and save canceled error/warning messages in the error log again

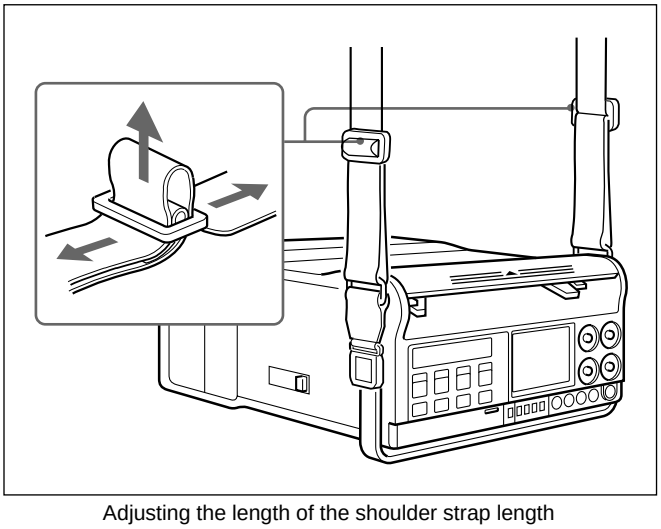
Do the procedure above to specify the messages to be displayed and saved in the log again, and then press the SET/FINE/SEARCH button.

Using the Shoulder Strap and Carrying Case

Attaching the shoulder strap



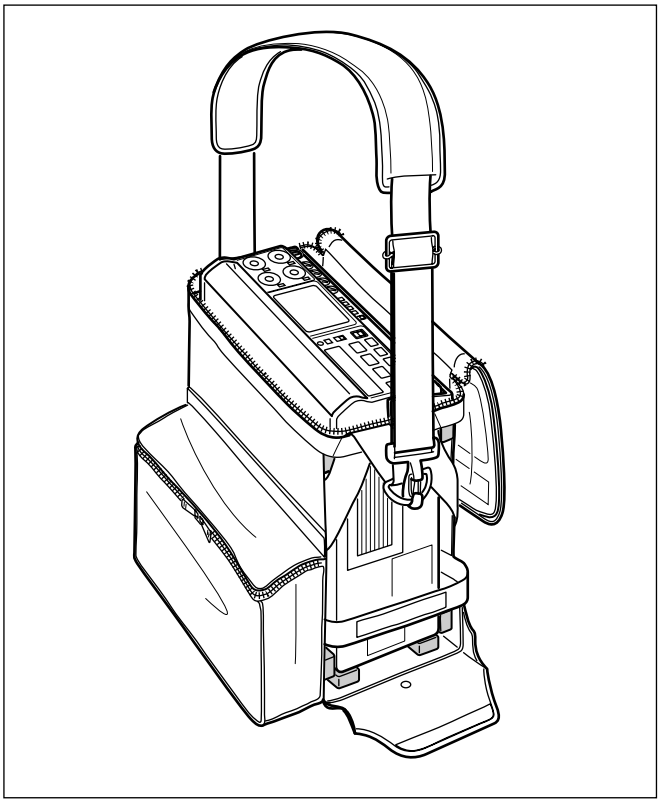
Attaching the shoulder strap clips



Adjusting the length of the shoulder strap length

Inserting the VTR into the optional carrying case

Insert the VTR into the optional HKDV-250 Carrying Case as illustrated below. Loading and unloading of cassettes, inserting and replacing the battery pack, and operations using the front panel controls are all possible while the VTR is in the case.



Inserting the VTR into the optional carrying case

Note

When the VTR is inserted in the carrying case, it may become hot when operated for a long time. Direct skin contact with the VTR at this time may cause a burn.

For details on the use of the carrying case, refer to the instructions supplied with the HKDV-250 Carrying Case.

Specifications

General

Power requirement
12 V DC +5.0/–1.0 V
Power consumption
Approximately 40 W (when MODE switch set to OFF, CONFI switch to OFF, and output from the HD SDI OUT connector and COMPOSITE MONITOR OUT connector off)
Operating temperature
0°C to 40°C (32°F to 104°F)
Storage temperature
–20°C to +60°C (-4°F to +140°F)
Operating humidity
25 % to 85 % (relative humidity)
Mass Approximately 7.8 kg (17 lb 3 oz) (VTR alone)
Dimensions 317 × 154 × 349 mm (w/h/d) (12 1/2 × 6 1/8 × 13 3/4 inches)
Recording format HDCAM
Tape transport speed
96.7 mm/second
Recording/playback time
124 minutes (with L-size cassette)
40 minutes (with S-size cassette)
Fast-forward/rewind time
420 seconds or less (with L-size cassette)
150 seconds or less (with S-size cassette)
Fast-forward/rewind speed
Maximum 24 times normal speed
Search speed Maximum 8 times normal speed (selectable 2 times, 5 times, and 8 times)
Servo lock time Within 1 second (from pause mode)
Loading/unloading time
4.5 seconds or less
Applicable battery pack
BP-90A (nickel-cadmium)
BP-L60A (lithium ion)
Applicable cassette tapes
HDCAM cassette (S-size and L-size)

Video characteristics

Sampling frequency
Y: 74.25 MHz
P_B/P_R: 37.125 MHz
Quantization 10 bits/sample (compression: 8 bits/sample)
Error correction Reed-Solomon code
Error concealment Adaptive three dimensional
Compression Coefficient recording system
Channel coding S-NRZI PR-IV

Digital input to analog component output (reference playback)

Bandwidth Y: 0.5 to 21.0 MHz ±0.5 dB
P_B/P_R: 0.5 to 7.0 MHz ±0.5 dB
S/N ratio 58 dB or more
K factor (2T Pulse)
1% or less

Analog component input to analog component output (reference playback)

A/D quantization 10 bits/sample
Bandwidth Y: 0.5 to 21.0 MHz ±1.0 dB
P_B/P_R: 0.5 to 7.0 MHz ±1.0 dB
S/N ratio 56 dB or more
K factor (2T Pulse)
2% or less

Analog component input to analog composite output

A/D quantization 10 bits/sample
Bandwidth 0 to 5.5 MHz ±0.7 dB
S/N ratio 56 dB or more
Differential gain 2% or less
Differential phase 2° or less
Y/C delay 15 ns or less
K factor (2T Pulse)
1% or less

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Audio characteristics (reference playback)

Sampling frequency
48 kHz (video sync)
Quantization 20 bits/sample
Input A/D quantization
20 bits/sample
Output D/A quantization
18 bits/sample
Frequency response
20 Hz to 20 kHz +0.5 dB/–1.0 dB (0dB at 1 kHz)
Dynamic range 100 dB or more (at 1kHz, with emphasis on)
Distortion 0.03% or less (at 1kHz, with emphasis on)
Crosstalk –80 dB or less (1 kHz, between channels)
Wow and flutter Below measurable level
Headroom 20 dB (18 dB)
Emphasis T1=50µs, T2=15µs (on/off selectable)

Inputs and outputs

SDI (Serial Digital Interface)

SMPTE 291M, 292M, 299M (BTA S-004B, 005B, 006B)
HD SDI IN (BNC ×1)
High definition serial digital interface component input (including 4 audio channels)
HD SDI OUT (BNC ×1)
High definition serial digital interface component output (including 4 audio channels)

Camera interface

CAMERA (26-pin ×1)
Analog component video input
Y: 1.0 Vp-p, 75 Ω (negative sync)
P_B/P_R: 0.7 Vp-p, 75 Ω
Analog audio input
–60 dB/–20dB/+4 dB switchable
High-impedance, balanced
Genlock in sync output
TRI SYNC
0.6 Vp-p, 75 Ω (negative sync)
Return video output
Y: 1.0 Vp-p, 75 Ω (negative sync)
Camera power output
+10.6 V to +17.0 V
Maximum 5.0 A

Video interface

REFERENCE IN (BNC ×1)
Analog composite reference video signal input
1125/60 or 1125/59.94 reference video signal:
TRI SYNC
0.6 Vp-p, 75 Ω (negative sync)
525 reference video signal:
Black burst
0.286 Vp-p, 75 Ω (negative sync)
(selectable by menu operation)
ANALOG HD COMPONENT MONITOR OUT (BNC ×3)
High definition analog component video monitor output
$Y/P_B/P_R$: 0.1 Vp-p, 75 Ω unbalanced, based upon SMPTE 240M (BTA-S001B), character superimposition on/off selectable
COMPOSITE MONITOR OUT (BNC ×1)
Analog composite video monitor output
1.0 Vp-p, 75 Ω, character superimposition on/off selectable

Audio interface

AUDIO IN (XLR ×4)
Analog audio input
–60 dB/–20dB/+4 dB switchable
High-impedance, balanced

AUDIO OUT (XLR ×4)
Analog audio output
+4 dBm (0 dBm)
Low-impedance, balanced

HEADPHONES (Stereo phone jack ×1)
–17 dBu

EARPHONE (Stereo minijack ×1)
–17 dBu

Time code interface

TC IN (BNC ×1) Time code input
0.5 to 18 Vp-p, impedance 10 kΩ±10%

TC OUT (BNC ×1)
Time code output
1.0 Vp-p (75Ω), 2.2 Vp-p (10 kΩ)

Others

REMOTE (9-pin multi ×1)
Sony 9-pin protocol or RS-232C interface (switchable)

DC IN 12V (BNC ×1)
Power supply from AC adaptor

CAMERA REMOTE (8-pin multi ×1)
For camera remote control (Sony camera system 700 control protocol)

Supplied accessories

Shoulder strap (1)
Operation manual (1)
Maintenance manual part 1 (1)

Recommended equipment

BCT-HD12CL Cleaning Cassette
BP-90A/BP-L60A Battery Pack
BC-L100/BC-410 Battery Charger
MLB-1B-100 Memory Label
Maintenance manual part 2
RM-B150 Remote Control Unit
AC-550/AC-DN2A AC Adaptor
HKDV-250 Carrying Case

Design and specifications are subject to change without notice.

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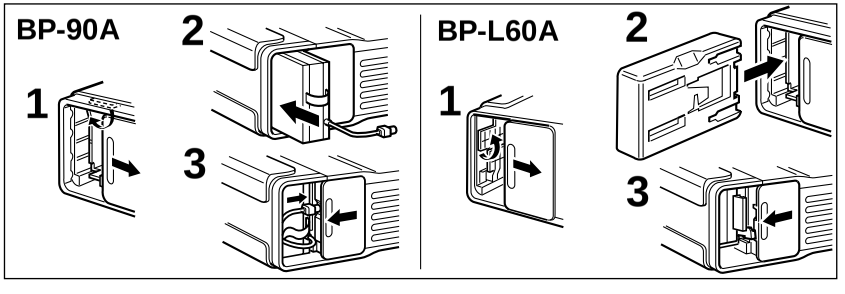
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1
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3

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HDW-250 (UC, 英)
3-203-023-**02**(1)

Sony online http://www.world.sony.com/

Printed in Japan
2000.08.13
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